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SLEEPING SICKNESS.

DYE (William H.). **The Relative Importance of Man and Beast in Human Trypanosomiasis.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1927. Nov. 25. Vol. 21. No. 3. pp. 187–198. With 3 maps. Also in *Jl. Roy. Army Med. Corps.* 1928. Mar. Vol. 50. No. 3. pp. 184–195. With 3 maps.

During the last twenty-two months the author has had under observation in the south-eastern part of Tanganyika a small outbreak of sleeping sickness due to *T. rhodesiense* and spread by *G. morsitans*, which, owing to its limited scope, and the fact that the inhabitants were not allowed to leave the area, gave certain opportunities for observation. According to native tradition, the area in question, which is situated in the Liwale Valley close to its junction with the Matandu, has a sinister reputation.

In December, 1924, sleeping sickness appeared in the village of Namabao and by March, 1925, 42 deaths had occurred and 24 cases of the disease were found. The survivors, both sick and healthy, were removed later and segregated in a fly-free camp. This village had stood for 2½ years in a densely infested fly area without apparently an abnormal death rate. It consisted of two groups of houses and no attempt was made to clear the bush, which grew up to, and between the houses, and was swarming with fly.

Another village, Kiringulla, about ten miles further south, had been in existence for a number of years and was on a favourable site and surrounded by gardens. This village escaped to a very great extent, although the surrounding bush was heavily infested with fly. Ten miles further south lies another village, Ali Kuperwiro, which has been in existence for 2½ years and in all respects resembles Namabao.

The author finds certain points of interest in this state of affairs. Firstly, the exemption from disease of Kiringulla, although situated midway between two badly infested villages. Secondly, Namabao for a period of 2½ years was free from disease, although all conditions of fly, game, etc., must have been constant and sleeping sickness was present in this part of Tanganyika. This the author considers to be highly suggestive of the introduction of an infective agent about 2½ years after occupation of the village. Thirdly, as is shown in a map of the whole area, the number of cases per individual village appears to depend on the freedom, or otherwise, of the village from fly, the distribution of fly in the surrounding bush having no influence on

the sickness rate. The inhabitants of all villages were equally exposed to the bites of tsetse in the bush, but not to those of flies haunting the villages. This suggests that whatever the original cause of the outbreak the infection is spread from man to man and not from game to man. Many individual cases were investigated in the hope of determining the mode of infection, but with little success.

An interesting experiment was performed at Namabao. Two months after the population had been removed, the healthy survivors were allowed to return. The village had deteriorated, all paths were much overgrown, the bush was evident between and about the huts, spoor of game of all sorts lay everywhere, and elephants had pushed off roofs in search of food; the presence of fly could not be ignored. Although they remained in the village for 2½ months and were kept under observation for 20 months afterwards none of these survivors developed sleeping sickness. The author concludes that by removing the human source of the infection the site again became healthy and safe for habitation. Details are given of a number of cases in which it appears that infection was definitely transmitted by local village tsetse from man to man.

At the end of 1926, and the beginning of 1927, two small recrudescences of the disease took place. By this time the country was intimately known and the inhabitants had been listed. As the quarantine was still in force, it was possible to check accurately and periodically all the inhabitants. Details of these recrudescences convince the author that it is difficult to associate the distribution with any but man to man infection. The article concludes with certain recommendations regarding preventive measures.

W. Yorke.

CARPENTER (G. D. Hale). **Annual Report on Sleeping Sickness for 1926.** —*Uganda Protectorate Ann. Med. & San. Rep. for the Year ended 31st December, 1926.* Appendix No. II. pp. 64–71.

In this report Carpenter summarizes the position at that date in the various infected areas in Uganda.

The Victoria Nyanza Infected Area.—Little has been done in the way of dealing with the numerous irregularities and undesirable encroachments, and much progress will be impossible without adequate staff. FISKE has proposed that there should be distinction between "safe," and "dangerous" or "doubtful," areas. In the former no restrictions will be necessary, but in the latter occupation would only be permitted so long as no infection was found, or until the medical authorities considered evacuation necessary. This proposal was finally agreed to. In order to test the working of this scheme Carpenter examined the coast of Busiro Saza from Entebbe to the Kyadondo boundary, marking out a danger line as he went. Encroachment was found to have taken place on a very large scale, uncleared watering and landing places were in use and plantations were being opened up in the forest belt on the coast. In the Sese Islands it is reported that all landing places had been inspected, and while twenty required more attention, the majority were found to be satisfactory. Many of the private estates were, however, fly infested. At Koja, where it is desired to establish a Government stock farm, it was decided that, provided certain clearings were made, the peninsula could be re-opened

for this purpose. No fishermen have yet been found infected except in the Mjanji area, but infection has been introduced on the Kyadondo coast near Kampala.

The Victoria Nile, Jinja-Kakindu Area.—The present state of affairs in this area is practically unknown, as it has not been possible to tour it or to make any other recommendations than those put forward in 1922, which in 1923 were found not to have been carried out.

The Mpologoma Area.—It was not found possible to tour this area in 1926, but Dr. VAN HOOF reported that the disease seemed to be actually arrested. The native inspector examined the population along the Busoga bank, but found no cases of the disease.

The Busitema Area.—Dr. VAN HOOF reported that there is still active trypanosomiasis in this area, and that the majority of cases are old men and children charged with the care of cattle.

The Siroko Valley Area.—This area has not been visited. So far as is known the Glossina is still uninfected.

The Katwe Area.—The part in the Toro district has been inspected several times during the year and administrative measures have been planned, which should materially reduce the risk resulting from the movements of natives in the Belgian Congo and the conditions under which the salt traffic is carried on. Carpenter believes that the cases found at Katwe had undoubtedly contracted infection in the Congo or in the frontier country. The part of the area in Ankole district is healthy and no case of sleeping sickness has been discovered. The portion in the Kigezi district has not been visited.

The Wasa River Area.—Apart from the road to Ntoroko Port, this is intended to be uninhabited and unoccupied. A wholesale disregard of sleeping sickness regulations was found to be occurring.

The Bwamba Area.—The position here appears to be more satisfactory. The area was toured in September, and it was found that recent cases of sleeping sickness had either been formerly resident in the closed part of the area, or, in a few instances, came from the Congo.

The Buganda Lake Albert Area.—This is uninhabited and has not been visited.

The Bunyoro Area.—The area was visited and no cases were found.

The Nile Area.—The part in the West Nile district has not been toured, but no deaths from sleeping sickness were reported.

a. The Acholi Area.—It was not found possible to tour this area in 1926, but a medical officer was stationed at Gulu for part of the year. Of the sixty deaths reported, seven only occurred in counties other than Keyo. The people around Keyo were removed in 1924 from the dangerous old road along the Oiteno and Unyama valleys and it is still possible that the deaths are due to former infection.

b. The Madi Area.—It was impossible to visit this area during the year. The estimated population shows a distinct increase which the author thinks may justly be ascribed to efforts made to attack sleeping sickness. The death rate in Madi during 1926 from sleeping sickness was 2 per 1,000.

It was not found possible to tour the part of the area in the Chua district, but the Medical Officer was at Kitgum for part of the year, and the Sub-Assistant Surgeon toured the road from Kitgum to the Assua River and found no cases of sleeping sickness among the population of that area. Later, the district Medical Officer toured the south-

eastern part of the district and found no cases. The clearings are reported to be satisfactory. Towards the end of the year four cases were reported by the Sub-Assistant Surgeon.

W. Y.

LEDENTU (G.) & VAUCEL (M.). Sur la valeur comparée de la réaction de Gaté et de l'auto-agglutination des hématies, comme signes de présomption de la maladie du sommeil. [**Comparative Value of Formol-Gel Reaction and Auto-Agglutination of Red Cells in Diagnosis of Trypanosomiasis.**]—*Bull. Soc. Path. Exot.* 1927. Oct. 12. Vol. 20. No. 8. pp. 737–741. [2 refs.] [Pasteur Inst., Brazzaville.]

The only means of diagnosing trypanosomiasis with certainty is by discovering the parasite, but this is, in not a small proportion of cases, a very difficult matter. Consequently, it is desirable to discover another test for the infection. The only tests which appear to be of any real use are autoagglutination of the red cells and the formol-gel reaction, and it is the object of the present paper to compare the relative value of the two.

Among 74 untreated cases of trypanosomiasis agglutination never failed; on 21 occasions the reaction was strong, on 39 moderate, and on 14 feeble. The reaction of Gaté (formol-gel) was examined on the same 74 cases and gave practically the same result; where auto-agglutination was marked the formol-gel reaction was rapid and *vice versa.*

The existence of the two phenomena was then investigated among 96 apparently healthy persons; some of these were undoubtedly free from the disease, but in others—the more numerous—the occurrence of enlarged glands gave rise to suspicion that possibly they were really infected, although all efforts to discover parasites had failed. In these 96 an absence of autoagglutination was noted 26 times, i.e., in 27 per cent. The absence of autoagglutination was always accompanied by a negative formol-gel test. In 34 of the 70 positive cases the autoagglutination reaction was strong and in 36 it was feeble. On the contrary, among these 70 cases the formol-gel reaction was positive only 23 times.

These figures suggest that the autoagglutination phenomenon gave 73 per cent. of errors as compared with 27 per cent. in the case of the formol-gel test. But it is possible that some of these cases were actually infected, and consequently the above figures representing the errors are too high.

The general conclusions are that in all cases of trypanosomiasis in which parasites are found, the autoagglutination and formol-gel reactions are positive and parallel; the absence of autoagglutination always coincides with a negative formol-gel reaction and this permits one to exclude trypanosomiasis. In cases where trypanosomes have not been found, a rapid formol-gel reaction is much less frequent than autoagglutination, and consequently it is to be presumed that the former has the greater diagnostic value.

W. Y.

LEDENTU (G.) & VAUCEL (M.). La réaction du benjoin colloïdal dans la trypanosomiase humaine. [**Colloidal Benzoin Reaction in Human Trypanosomiasis.**]—*Bull. Soc. Path. Exot.* 1927. Nov. 9. Vol. 20. No. 9. pp. 865–875. [Pasteur Inst., Brazzaville.]

The conclusions are :—

1. The colloidal benzoin test, limited to 5 tubes, does not give results of interest with the cerebrospinal fluid of patients infected with trypanosomes. Flocculation is the rule in all cerebrospinal fluids with hyperalbumosis or hyperlymphocytosis.

The Bordet-Wassermann reaction was not performed in these positive liquids. But it is difficult to believe that a syphilitic meningitis was present in the absence of any specific symptoms.

2. The complete reaction with 16 tubes is of little interest from the diagnostic point of view ; the presence of the trypanosomes, the result of lumbar puncture and the symptomatology furnish obvious information.

It may, on the contrary, be of great service in prognosis.

(*a*) To a profound damage of the nervous system, sometimes not indicated by the clinical state and the immediate results of lumbar puncture (hyperlymphocytosis and hyperalbuminosis), corresponds a flocculation reaction affecting the ' meningitic zone.'

This slight ' paralytic reaction ' is the rule in the mental troubles, tics, and somnolence of non-treated individuals. Its occurrence permits the conclusion that the nervous system is invaded in individuals who are not complaining of any trouble and whose spinal fluid is but slightly altered.

(*b*) After treatment, and even in the absence of clinical signs and modifications of the spinal fluid, the flocculation of the ' meningitic zone ' is an indication for the continuation of treatment or prolonged observation of the patient.

(*c*) Coinciding with a grave alteration of the spinal fluid in patients whose general state appeared satisfactory, it seems to allow of the differentiation of the arsenical reactions from those due to the evolution of the disease after cessation of treatment.

(*d*) Treatment reduces the reaction towards the left. The persistence of the flocculation in the syphilitic zone only indicates an amelioration in the state of the nervous system and is a favourable prognostic sign.

(*e*) The colloidal benzoin reaction, definitely negative, is an indication which, when added to the other signs, suggests cure.

W. Y.

FISCHER (Otto). Beobachtungen an einem Fall von afrikanischer Schlafkrankheit. [**A Case of African Sleeping Sickness.**]—*Abhandl. a.d. Gebiet d. Auslandskunde. Hamburg. Univ.* 1927. Vol. 26. (D., Med. & Vet. Vol. 2.) [Festschrift NOCHT.] pp. 98–102. [Inst. for Ship & Trop. Diseases, Hamburg.]

Details are given of a case of sleeping sickness—a man 25 years of age who contracted the disease in the English portion of the former German Colony, Cameroons. The case is of interest on account of the extraordinary difficulty of treatment. Notwithstanding several administrations of " Bayer 205 " in considerable doses relapses could not be prevented. Although it is now seven months since the last relapse, it is impossible to be certain that the patient is actually cured, but the decrease in the mononuclear count since the last febrile disturbance may be regarded as an indication of cure. Even if a further relapse should occur, the prognosis could still be regarded as favourable.

The cause of the resistance exhibited by this case to treatment is obscure. Most probably it was due to an insensitiveness of the parasites to the drug. Possibly this was the result of the adoption at first of KLEINE's scheme of

administering " Bayer 205 " viz., one gramme on each of the first, third, tenth, and eighteenth days—a procedure which, owing to the rather lengthy intervals, gave the parasite the opportunity of becoming drug resistant.

In an addendum it is noted that the patient relapsed again after this paper was published.

W. Y.

CONNELL (W. K.). **A Case of Sleeping Sickness with Some Unusual Features.**—*Tanganyika Territory Ann. Med. & San. Rep. for the Year ending 31st December, 1926.* pp. 112–113.

An account is given of a case of sleeping sickness which presented a number of points of especial interest ; these are :—

(1) The fact of the disease *starting* with somnolence and progressing to insomnia.

(2) The unusually large number of parasites—sometimes as many as 3 or 4 in an oil immersion field.

(3) The development of wrist-drop (which disappeared under treatment) and of deltoid paralysis (which persisted in spite of treatment).

(4) The wonderful improvement, even if it should prove to be only temporary, brought about by " Bayer 205."

(5) The fact that no albuminuria appeared throughout the course of Bayer treatment.

W. Y.

VAN DEN BRANDEN (F.). Seconde note préliminaire sur des essais d'administration de Bayer 205 prophylactique à des agglomérations indigènes. [**Prophylactic Trials of Bayer 205 in Native Villages.**] —*Ann. Soc. Belge de Méd. Trop.* 1927. Nov. Vol. 7. No. 2. pp. 147–149.

Following the trial of " Bayer 205 " as a prophylactic made by the author at Biza in 1923 [this *Bulletin*, Vol. 23, p. 423] further similar tests have been made at Mikunga and at Masina. The general procedure was the same. The infected cases were treated in the ordinary manner ; the healthy adults were given two injections of the drug each of 1 gm., the young people two injections of 0·5 gm., the children two of 0·25 gm., and the sucklings two of 0·1 gm. each. The injections were made at an interval of 2 to 3 weeks. Before the experiment the inhabitants of each village were subjected to two examinations, the first at the beginning of the first half of 1925, and the second at the beginning of the second half of the same year. The result of the examination is shown in a table.

Six months after the prophylactic treatment the people were re-examined. At Mikunga no new case was discovered and at Masina only one and he was absent from the village at the time the injections were given and so escaped the injections.

During 1926 two further re-examinations were made—one during each half of the year. At Mikunga one case was discovered during the first of these examinations, but he had not had the prophylactic injections, and two cases during the second of the examinations, and these had come to Mikunga from another infected village. At Masina a case was found among those who had received the prophylactic injections ; the changes in his spinal fluid, however, gave reason to believe that he was really infected when he had the injections.

Thus before the prophylactic injections 17 cases were found, and at the examinations afterwards only 3 cases. It is noted that these two villages have been regularly visited since 1920, and the sick treated with a prolonged course of sodium-emetic ; and it is inferred that the diminution in the percentage of infected is to be attributed to the prophylactic injections of Bayer 205.

W. Y.

LEDENTU (G.). Quelques résultats éloignés du traitement de la maladie du sommeil par la tryparsamide. [**Late Results of Treatment of Sleeping Sickness by Tryparsamide.**]—*Ann. Inst. Pasteur.* 1927. Sept. Vol. 41. No. 9. pp. 982–1001. [2 refs.] [Pasteur Inst., Brazzaville, French Equat. Africa.]

This paper gives information regarding the later history of a number of the 130 cases of sleeping sickness treated with tryparsamide at the Pasteur Institute of Brazzaville during the period November, 1925, to October, 1925. Most of the cases have already been reported before by LAIGRET [this *Bulletin*, Vol. 23, p. 425 and p. 900].

The majority of the cases dealt with in this paper have been under observation for between 1½ and 2 years. Of the 130 some have died either from sleeping sickness or intercurrent disease, and others have ceased to report, probably because they are now enjoying good health. The remaining 64 are considered here. The cases are grouped into the same 4 categories, according to their clinical and pathological state when treated, as in LAIGRET's report, and details regarding the results obtained in the cases falling into each group are given.

1. At the beginning of the second stage.—This group contained only 4 cases and of these 2 are apparently cured after an observation period of 13 and 18 months, respectively ; and 2 have relapsed with parasites in their blood.

2. Second stage with apparent preservation of health.—Of this group 28 cases have been followed up : 23 have remained apparently cured for more than a year ; 2 were improved by a first course of treatment and apparently cured by a second ; and 3 relapsed, possibly owing to previous atoxyl or possibly owing to the insufficient intensity of the first course of tryparsamide.

3. Advanced second stage.—Of the 24 cases falling into this group 13 are apparently cured, 2 have improved and 9 have relapsed.

4. Terminal stage.—In this group there are six successes, 1 improvement and 1 dead.

The author's conclusions are as follow :—

The treatment by tryparsamide of patients in the second stage of sleeping sickness has given a very high percentage of cures : 62·5 per cent. have had no further treatment for periods varying from 9 to 24 months.

This success has been obtained with relatively small doses of the drug—about 25 gm. for an adult of 50 kilos.

Previous administration of atoxyl does not interfere with the action of tryparsamide. The arsenic resistance created by it is but slight ; on the contrary, however, an ineffectual course of tryparsamide provokes very definite arsenic resistance.

In some cases good results were obtained by a mixed treatment.

Previous atoxylization increases the chance of ocular disturbances

and the author believes that the dose of tryparsamide in these cases should be reduced to the extent of ·015 cgm. per kilo. of body weight.

The relapses, which number 18·7 per cent., are in general considered to be the result of insufficient treatment.

W. Y.

LEDENTU (G.) & VAUCEL (M.). Nouveaux essais de traitement de la maladie du sommeil par la tryparsamide. [**New Trials of Treatment of Sleeping Sickness by Tryparsamide.**]—*Ann. Inst. Pasteur.* 1927. Nov. Vol. 41. No. 11. pp. 1200–1232. [2 refs.] [Pasteur Inst., Brazzaville.]

This paper records the immediate results obtained in the treatment of cases of sleeping sickness by tryparsamide in 1926, and also of a number treated in 1925, which were for various reasons not referred to in the authors' earlier publication [see previous summary]. It is hoped to record later the ultimate result of the treatment of these patients.

The cases are grouped into the following five categories according to the plan adopted by LAIGRET [this *Bulletin*, Vol. 23, p. 900] :—

(1) First stage ; (2) at the beginning of the second stage, the spinal fluid containing not more than 70 lymphocytes per cmm. and 0·5 gm. of albumin per litre ; (3) second stage with apparent preservation of health, the spinal fluid being profoundly altered without clinical signs ; (4) advanced second stage with clinical symptoms ; and (5) terminal stage.

The results of the treatment of each of these groups are recorded in detail and are summarized in tables.

The following are the conclusions :—

The results obtained in the treatment by tryparsamide of 165 patients in various stages of the disease recorded in this paper are not final since the observation after the cessation of treatment did not, on the average, exceed five months.

1. In the first stage when lumbar puncture did not reveal any involvement of the central nervous system the treatment by tryparsamide was not impressive ; 12 per cent. of relapses were recorded ; moreover, it was noticed in more advanced periods of the disease that the trypanosomes reappear in the blood after the administration of considerable doses of the drug (0·5–0·6 gm. per kilo of body weight). It has not yet been possible to establish that the treatment at this stage of the disease prevents the invasion of the nervous system.

2. So soon as the invasion of the nervous system is proved by lumbar puncture treatment by tryparsamide is truly impressive. For the patients of the first and second categories of this stage the successes obtained were respectively 86·5 and 73·0 per cent. of those treated. A previous course of treatment by another arsenical preparation in no way mitigated the beneficial action of tryparsamide.

Even in the advanced stage 53 per cent. of successes, and 15·62 per cent. of amelioration were obtained ; these results are most encouraging. In the terminal stage the successes were not more than 23 per cent., but it must be remarked that many of the cases were moribund when treated and all other remedies had failed. Sensational results may be obtained with patients in this stage of such a nature as to appeal vividly to the imagination of the natives.

3. In all the authors' cases the drug was injected in series graduated between 0·02 and 0·055 gm. per kilo. of body weight, The intercalary period between the series was, as a rule, 45 days.

The evolution of the disease has shown that only those patients are benefited greatly by the treatment who were improved considerably by the first series of injections, which rarely exceeded 0·25 to 0·30 gm. per kilo.

Where first control lumbar punctures revealed only a slight modification or an amelioration which was transient, the prognosis has always been poor. The repetition of the cures has only ameliorated cases of this class with great difficulty.

In some cases the third and fourth series has been followed by a hyperlymphocytosis or hyperalbuminosis, indicating often a veritable "coup de fouet" but coinciding sometimes with such a conservation of the general condition as to make one think of a true meningeal reaction without further evolution of the trypanosomiasis.

This method of giving the drug in series of injections has enabled one to avoid ocular accidents, which have only occurred in 5 per cent. of the patients and have in general been mild.

4. The success thus obtained by the injection of the first series of the drug and with relatively moderate doses, caused the authors to think that it would be of interest to prolong the treatment beyond 6 or 7 injections, but to limit the injections to the smaller doses. Observations on this point are now in progress.

5. Treatment by tryparsamide allows one to hope for the definite cure of a large number of patients.

The necessity of prolonged observation with periodic blood centrifugings and lumbar punctures renders its application difficult by travelling units without specially equipped dispensaries.

W. Y.

Ledentu (G.) & Vaucel (M.). Contribution aux essais du traitement de la trypanosomiase humaine par le "Tryponarsyl" (paraglycinamidephénylarsinate de soude). [**Trial Treatment of Human Trypanosomiasis by Tryponarsyl.**]—*Bull. Soc. Path. Exot.* 1927. Nov. 9. Vol. 20. No. 9. pp. 875–883. [Pasteur Inst., Brazzaville.]

The simultaneous experimentation with tryparsamide and "Fourneau 270" has only allowed 25 cases of sleeping sickness to be treated with "Tryponarsyl" at the Pasteur Institute of Brazzaville.

The following are the conclusions :—

1. Twenty-five cases of sleeping sickness have been treated with "Tryponarsyl."

2. Four cases in the first stage of the disease were all successfully treated and had not relapsed within 5 months. Among those in the second stage the results are particularly interesting in the patients of the second and third category (those with well-marked nervous signs). Thirteen such cases were treated with 9 successes, 1 amelioration, 2 failures and 1 death.

3. The drug has been given intravenously at weekly intervals. Generally speaking the medication has been perfectly tolerated. The initial doses given were ·035 gm. and the final doses ·08 to ·09 gm. per kilo.

Four patients suffered from ocular disturbances, which in three cases were limited to temporary amblyopia which disappeared on cessation of treatment.

4. The failures all appeared to be due to premature cessation of treatment allowing the hyperalbuminosis of the spinal fluid to persist ; the doses were either insufficient or treatment had to be stopped on account of eye troubles. Further treatment is then powerless to arrest the disease. The same conclusions have been reached in regard to tryparsamide.

5. The feeble toxicity of " Tryponarsyl " makes it a very interesting drug and allows of the administration of prolonged courses, which appear at the moment the best treatment for sleeping sickness.

W. Y.

VAN DEN BRANDEN (F.). Essais de traitement de la trypanosomiase humaine chronique par le " 270 " Fourneau. Note préliminaire. [**Trial Treatments of Chronic Human Trypanosomiasis by 270 Fourneau.**]—*Ann. Soc. Belge de Méd. Trop.* 1927. Nov. Vol. 7. No. 2. pp. 99–109. [Leopoldville Lab., Belgian Congo.]

The drug " 270 Fourneau " is the sodium salt of acetyl-p-amino-oxyphenyl-arsenic acid ; it is a greyish white powder readily soluble in water. The author administered it intravenously as a 20 per cent. solution in distilled water, but it can also be given subcutaneously.

Fourteen patients were treated ; one disappeared after having received a single dose of 1·5 gm. Repeated gland punctures at short intervals showed that the drug has a marked trypanocidal action ; peripheral sterilization is produced in adults of from 45 to 60 kilogrammes within one or two hours by an intravenous injection of 1·5 to 2 gm. The duration of the peripheral sterilization produced by a single dose of the drug was not investigated, the author concerning himself practically entirely with the action in chronic cases.

Examination of the spinal fluid of the 14 patients treated showed a lymphocytosis varying from 6·8 to 2,080 per cmm. Owing to the limited quantity of drug available the patients received altogether from 15 to 28·5 gm. in weekly doses of 1 gm., 1·5 gm., or 2 gm. The results are comparable with those obtained with tryparsamide. No blood relapse was observed and most of the patients put on weight. Clinical details of each of the 14 cases are given.

W. Y.

LEDENTU (G.) & VAUCEL (M.). Note complémentaire sur le " 270 Fourneau " en trypanosomiase humaine. Résultats en fin août 1927. [**Further Note on 270 Fourneau in Human Trypanosomiasis.**] —*Ann. Inst. Pasteur.* 1927. Nov. Vol. 41. No. 11. pp. 1233–1242. [1 ref.] [Pasteur Inst., Brazzaville.]

The drug preparation " 270 Fourneau " has been tested on a considerable number of patients at Brazzaville and, although it is as yet too early to form a final judgment regarding its action, the present note draws attention to the duration and validity of the apparent cures obtained.

Two orders of results are envisaged :—

A. Old patients treated from November, 1925, to May, 1926, and forming the subject of a previous article [this *Bulletin*, Vol. 24, p. 565].

B. New patients treated from May to September, 1926. The patients comprising each of these two groups are divided according to whether they were in the first or second stage of the disease and the results are described in detail and summarized in tables.

The following are the conclusions :—

1. The preparation " 270 Fourneau " has at Brazzaville been made the object of a prolonged examination of which the results will be communicated later.

2. In the light of observations already relatively old and concerning patients the treatment of whom finished at least a year ago, it is possible to be certain that the French product easily bears comparison with tryparsamide.

(*a*) In the first stage of the disease and after only a single series of injections amounting to about 0·24 gm. per kilo, the authors have met with some cases in which sterilization has been maintained for more than a year, with normal spinal fluid. The drug, which is slightly more toxic, should apparently be injected in an initial dose of 0·02 gm. per kilo and should gradually be increased to a maximum amount of 0·03 gm. per kilo.

(*b*) In the second period, vomiting and emaciation, which are probably signs of a greater elective action on the nervous system, compel more prudence. In cases with pronounced changes in the spinal fluid the initial dose should not exceed 0·015 gm. per kilo and should not be increased beyond 0·04 gm. per kilo.

It is not yet possible to give the percentage of brilliant results and of failures, in order to compare the drug with tryparsamide. But it is already established that for the one as for the other of these drugs the best prognostic of cure is furnished by the return of the spinal fluid to normal at the end of the first course of injections. The results obtained by smaller amounts than 0·25 gm. per kilo are very transient.

The cures of consolidation appear useless; those of recovery after relapse illusory.*

The failures are observed as a rule seven months after the end of an insufficient treatment.

Previous atoxyl treatment does not appear to interfere with the therapeutic action of "270 Fourneau."

The ocular disturbances are not more frequent than are those due to tryparsamide.

3. When injected in a single very prolonged series "270 Fourneau" appears to give very good results, quite as satisfactory as, if not superior to, those obtained with tryparsamide. The fact that it can be readily given subcutaneously makes it a weapon of predilection.

W. Y.

VAN DEN BRANDEN (F.), CLEVERS & MOREELS. Essai de traitement de la trypanosomiase humaine et des infections animales à *T. congolense* par le "2754" Hoechst. Note préliminaire. [**Treatment of Human Trypanosomiasis and *Congolense* Infections in Animals by 2754 Hoechst.**]—*Bull. Soc. Path. Exot.* 1927. Oct. 12. Vol. 20. No. 8. pp. 734–737. [Lab., Léopoldville.]

The drug examined was obtained from Hoechst; it is a new pentavalent arsenical numbered 2,754, containing 27·2 per cent. of arsenic and allied to tryparsamide. It was supplied in ampoules containing 1, 2 and 3 gm. for the treatment of human cases and in ampoules containing 8, 10 and 12 gm. for use in animals.

In human beings the drug was given intravenously in doses of 2 or 3 gm. diluted in 10 cc. of distilled water. Six patients, 5 of whom were chronic, were treated. One patient weighing 53 kilos. appeared worse after ten injections each of 3 gm., given at an interval of 5 days; his urine contained albumen, but on suitable diet this disappeared and the treatment was continued, 2 gm. per week being given without further trouble. In a second patient signs of renal irritation appeared after a course of seven injections each of 3 gm. given within 33 days.

* Les cures de consolidation paraissent inutiles; celles de repêchage, après rechute, illusoires.

Peripheral sterilization was, as a rule, obtained 4 or 5 hours after an intravenous injection of 2 or 3 gm. No attempt was made to ascertain the duration of the peripheral sterilization following a single dose. Details are given concerning each of the six patients treated by a first series of injections. From these it appears that " 2754 Hoechst " has a trypanocidal action ; in two patients at the beginning of the second stage the lymphocytosis of the spinal fluid disappeared after a series of 10 injections of 2 gm. each, given at 5 or 6 day intervals. In a third patient the lymphocytosis was greatly diminished after the administration of 20 gm. given in weekly doses of 2 gm. Observation of the patient is being continued.

The drug was further tested in two mules infected with *T. congolense.* The conclusion reached was that as is the case with all other arsenicals " 2754 Hoechst " has no action on this trypanosome.

W. Y.

Chesterman (Clement C.) & Todd (Kenneth W.). **Clinical Studies with Organic Arsenic Derivatives in Human Trypanosomiasis and Yaws.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1927. Nov. 25. Vol. 21. No. 3. pp. 227–232. [2 refs.]

Four cases of sleeping sickness in all of which the cerebro-spinal fluid was greatly changed were treated by oral administration of tryparsamide (base). Doses up to ·15 gm. per kilo could be tolerated after initial smaller doses and, apart from slight diarrhoea or vomiting, no sign of poisoning was noted. All showed marked clinical improvement and this was confirmed by spinal puncture. Progress was, however, slow and in two cases it was thought wise to continue treatment by injection of the sodium salt.

Clyclosan, another pentavalent arsenical, somewhat resembling tryparsamide, has proved actively trypanocidal in animals ; it is, however, somewhat toxic. It was tried orally on two patients, but its trypanocidal power in human beings was found to be small. Its toxic properties precluded further trial.

W. Y.

Fourche (J. A.). Résultats prophylactiques comparés, donnés par deux méthodes différentes de traitement, appliquées en régions très infectées de trypanosomiase. [**Comparison of Prophylactic Results in Two Regions Severely Trypanosome-Infected and treated by Different Methods.**]—*Bull. Soc. Path. Exot.* 1927. Nov. 9. Vol. 20. No. 9. pp. 883–895.

In itinerant prophylaxis it is difficult to appreciate, even approximately, the extent to which treatment of the infected and their sterilization has protected the healthy population. The index of sterilization obtained amongst the old cases assures us that we have obtained a therapeutic result and from this it is deduced that a prophylactic result is also obtained, but this deduction has little quantitative value. It is asserted that if the index of new infections is slight the result has been good, whereas if it is high the result is bad. The natural evolution of the disease could be ascertained if it were possible to leave a sector, which has been thoroughly examined, without treating the sick; and this might serve as a standard of comparisons for similar sectors where the sick were treated.

The author continues to discuss in some detail the difficulties surrounding this problem, and then passes to a consideration of his own observations. During the present year he has fortunately had occasion to re-examine in the same manner, and after the same interval, two series of centres which were equally infected at the first examination and which had been subjected to two different methods of treatment. In one of them not only the definitely infected were treated, but also the suspects; and in the other only the certainly infected. The results of the re-examinations are set forth in the present paper.

The centres where both sick and suspects were treated were those of Kateba, Tshimbalanga and Mwamba Gufulu; in them 9·7 per cent. of the population was found to be infected at the first examination in 1926. The centres where only the sick were treated were those of Kamwenansafo, where 9·6 per cent. were found infected at the first examination. In the first group the treatment of the sick and suspects (i.e., showing typical glands, but puncture negative) was 6 to 10 injections of 1 gm. of atoxyl, and in the second group, where the sick only were treated, 12 injections of a similar amount of atoxyl were given. The first group were re-examined after an interval of 10 months, and the second after 12 months.

The results of the re-examination of the two groups are given in detail and are compared. The therapeutic result in the infected cases was excellent and equal in both districts. More than 85 per cent. of these cases were negative and in good health on re-examination. Turning to the result of examination of the new population, by which is meant the individuals who for one reason or another escaped observation at the first examination of the districts, it was found that of 675 such persons in the first district, where both definitely infected and doubtful cases were treated, 53 (8·0 per cent.) were infected, and of 1867 in the second district, where only the definitely infected were treated, 397 (8·76 per cent.) were infected.

The author now passes to a consideration of the number of new cases amongst the populations previously examined. In the first district the number previously examined was 1,889 and among these 18 definitely infected new cases were discovered and one doubtful case (1·0 per cent.); in the second district the number previously examined was 6,532 and among these 345 definite new cases were found and 57 doubtful cases (6·18 per cent.). In a footnote attention is drawn to the fact that in the second district a large number of the new cases were found to be those who were doubtful at the first examination.

The author believes that the differences in prophylactic results are only to be explained by the difference in the method of treatment.

W. Y.

Browning (C. H.) & Gulbransen (R.). **The Treatment of Relapses in Experimental Trypanosome Infections: Cures after Repeated Relapses without increasing the Dose of the Chemotherapeutic Agent.**—*Jl. Path. & Bact.* 1928. Jan. Vol. 31. No. 1. pp. 134–136.

It has been generally accepted that trypanosome infections are most readily sterilized by the initial treatment with a chemotherapeutic agent. Relapses respond less well to treatment; and if the same therapeutic substance is administered repeatedly in non-sterilizing

doses to an infected animal a drug resistant strain of the parasite tends ultimately to develop. The authors have found, however, that in mice infected with *T. brucei* cure may be brought about, in a proportion of cases, after a number of relapses have occurred, each of which was treated with the same dose of the same substance. The relapses were treated with 2·p-acetylaminostyryl-6· dimethylaminoquinoline methochloride. For the initial treatment either an allied compound was employed or a non-sterilizing dose of the same substance as was used in the relapses. The doses employed were always remote from the toxic limit. The trypanosomes used were three different strains of *T. brucei*, all of which caused death within 72 hours of inoculation. The interval between the relapses was quite irregular in many of the cases. Illustrations are given. It is evident from the irregularity of the intervals between the relapses that mere accumulation of the drug in the body did not account for the ultimate sterilization. This is further supported by the fact that a large number of relapses may fail to be cured by the same procedure, e.g., in an animal twelve relapses over a period of about 18 weeks. Also in prophylactic tests with control animals which received the largest dose of the drug employed and were then inoculated two days later practically no retardation of the progress of the infection occurred. It is further noted that a strain can be made resistant to the drug by the usual methods.

The authors point out that the factors involved in the explanation of this phenomenon are extremely complicated. They include on the part of the host the capacity of the tissues to co-operate with the therapeutic agent by immunity mechanisms, etc., and on the part of the parasite accommodation to the anti-bodies produced (serum-fastness), as well as alterations in susceptibility directly or indirectly to the drug, i.e., drug-fastness, or hypersensitiveness as tested in another animal. The present work has demonstrated that the changes in the various factors occurring in the course of relapses after treatment by chemotherapeutic agents need not always be adverse to the individual host, but may conduce to ultimate sterilization of the infection. This does not affect the principle that vigorous initial treatment affords the best prospect of cure. But in the light of the observations recorded above, it must not be assumed that, because a given therapeutic agent, in a given dose, has failed to effect sterilization initially or in a relapse, the same dose of the same drug must therefore necessarily fail to lead to cure in subsequent relapses.

W. Y.

REINER (L.) & KÖVESKUTY, Jr. (J.). Ueber den Wirkungsmechanismus von Bayer 205. [**The Mode of Action of Bayer 205.**]—*Deut. Med. Woch.* 1927. Nov. 18. Vol. 53. No. 47. pp. 1988–1989. With 2 text figs. [11 refs.] [Hyg. Inst., Hungarian Univ., Budapest.]

The problem of the mechanism of action of chemotherapeutic substances is still rather involved. The oldest view that the drugs act directly upon the micro-organisms was promulgated by EHRLICH and his school and received support from the investigations on the genesis of arsenic resistance. Brief reference is then made to the work of various other authors, some of whom support the hypothesis of direct action of drugs and others that of indirect action.

In considering the matter it is of importance to ascertain whether the first point of attachment of the drug is the infected animal or the parasite. This is, for various reasons, very difficult to investigate experimentally and in order to obtain information the authors decided to attack the problem indirectly.

From the blood of infected rats a trypanosome suspension was prepared and divided into two equal portions. To the first portion was added a mixture of bouillon and normal saline containing 0·5 per cent. " Bayer 205 " and to the second a mixture of the bouillon and saline only. After 30 minutes both were centrifuged and the trypanosomes washed thrice with fresh bouillon saline solution.

Four rats of approximately the same weight were selected and treated as follows.—Rat A was given 1 cc. of suspension I, Rat B 1 cc. of suspension II, Rat C 1 cc. of suspension I+0·1 cc. of suspension II, and Rat D 1 cc. of suspension II+1 cc. of the third washings of suspension I. Rats A, B and D all had the same number of trypanosomes, but different amounts of Bayer, whilst Rats A and C had the same amount of Bayer, but slightly different numbers of trypanosomes. The animals showed trypanosomes in their blood in the following order, Rats B, C, D, and A, and died in the same order. But whereas Rats B, C, D all died about the same time, Rat A lived much longer and if the dose of trypanosomes did not exceed a hundred thousand, it frequently lived indefinitely. From these experiments it is concluded that the survival of Rat A is due to the " Bayer 205." They furthermore enable one to decide whether the drug acts through the co-operation of the animal body, or directly on the parasite. If the co-operation of the animal organism were necessary, it would be immaterial whether the drug was bound to the parasite or not ; and Rats A and C, in which the amount of " Bayer 205," was the same, and the number of trypanosomes varied only by 10 per cent., would have died about the same time. It follows that the drug bound to the parasites had no action on the untreated trypanosomes injected at the same time. The drug exerts its action directly on the parasites, a *sine qua non* for which is the binding of the drug by the parasites.

Since " Bayer 205 " alone does not kill the trypanosomes, the animal body must take some part in the curative process. Possibly this fact corresponds to the normal defence against infective diseases, which, however, can only be effective against Bayer-laden trypanosomes. If this be the case the action of drugs is similar to that of opsonins. It is possible, however, that the drug which is bound to the parasites is changed—possibly through oxidisation—into a parasiticidal substance.

W. Y.

Moschkowski (Sch.). Zur Frage des Wirkungsmechanismus von Germanin (Bayer 205) auf Trypanosomen. [**The Mechanism of the Action of Germanin on Trypanosomes.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1927. Nov. Vol. 31. No. 11. pp. 541–552. [13 refs.] [Trop. Inst., Moscow.]

In the experiments described in this paper, the author used guinea-pigs, and to a less extent mice, infected with *T. brucei* or a trypanosome known as su-auru (*T. evansi*?) obtained from a camel naturally infected in the Russian Steppes. The first series of experiments had for their object the investigation whether the destruction of the trypanosomes

in guineapigs treated by " Bayer 205 " was due to a disturbance of their divisional processes as has been shown by MAYER and ZEISS to be the case in mice and by SEI and also by SHINTAKE in mice and rats.

The dose employed was usually ·05 gm. *per os* for a 600–800 gm. guineapig ; this caused the trypanosomes to disappear slowly from the blood and was generally followed later by a relapse. Dry blood films were subsequently made each day and 500 trypanosomes counted and classified into ten categories according to whether they were (1) normal, (2) had two blepharoplasts, (3) two nuclei, (4) two nuclei and two blepharoplasts, (5) dividing, (6) almost completely divided, (7) separating into three, (8) with three nuclei or three blepharoplasts, (9) blepharoplastless and (10) quite bizarre forms. The results of nine such experiments are set forth in tables. From these it is seen that there was no definite increase in the percentage of divisional forms.

A small series of experiments were next undertaken in order to examine the findings of MAYER and ZEISS, LANGE and KERSTEN and others that the trypanosomes present in the blood the day after treatment had lost their virulence. The results are set forth in tables from which it is seen that the subinoculated animals became infected in each instance.

A number of experiments were also performed with a view to ascertaining the action of " Bayer 205 " on the camel trypanosome *in vitro*. Concentrations of 1 : 1,000 of the drug acting on the trypanosomes for half an hour at 37° C. did not prevent infection when the mixture was subsequently injected into mice and guineapigs, but the incubation period was prolonged ; when the period of incubation of the mixture at 37° C. was lengthened to 1½ or 3 hours, infection did not take place when the mixture was subsequently injected into mice.

In order to compare the results of these experiments on the concentration which *in vitro* leads to a decrease of virulence of the trypanosomes, the author determined the concentration necessary to produce a cure on subcutaneous injection. The active concentration was found to be in the region of 1 : 3,000 of the body weight of the animal, which does not deviate much from the active dose *in vitro*. Insufficient dosing may convert an acutely fatal infection into a chronic infection in which the animals eventually die with cachexia, paralysis, and often without parasites in their blood.

W. Y.

GIEMSA (G.) & MAYEDA (S.). Ueber trypanozide Wirkung eines neuen organischen Arsenpräparates " B.R.68 " bei Naganamäusen. [**The Trypanocidal Action of a New Organic Arsenic Preparation " B.R.68 " in Nagana Mice.**]—*Abhandl. a.d. Gebiet d. Auslandskunde. Hamburg Univ.* 1927. Vol. 26. (D., Med. & Vet. Vol. 2.) [Festschrift NOCHT.] pp. 139–145. [Inst. for Ship & Trop. Diseases, Hamburg.]

In the compounds of arsinic and arsenic acids hitherto employed therapeutically (atoxyl, tryparsamide, spirocide, salvarsan, arsalyt, Albert 102, etc.) the arsenic is always bound on to the benzol nucleus. BINZ and RÄTH have, however, lately succeeded in introducing arsenic into heterocyclic ring systems with cyclically bound nitrogen (pyridin, chinolin), and have produced a number of new well-characterized compounds of pyridin and chinolin groups.

It is with one of these, "B.R.68," the formula of which is not disclosed—for the same reason that those of "Bayer 205" and plasmochin were withheld—that the authors have conducted their therapeutic experiments in mice infected with *T. brucei*. The product is a yellowish brown powder readily soluble in water and forming a neutral solution which can be immediately injected. It was supplied in ampoules. The toxicity on subcutaneous injection is compared with that of tryparsamide and atoxyl. The maximum tolerated dose per gm. of mouse is given as follows—"B.R.68" ·2 mgm., tryparsamide ·62 mgm., atoxyl ·2 mgm., and the lethal dose as ·25 mgm., ·7 mgm. and ·25 mgm. respectively. The therapeutic action of the three substances was tested in mice infected with the nagana strain "Prowazek" and also with an arsenic resistant strain "30." The experimental results are set forth in tables. It was found that under these conditions "B.R.68" was distinctly more efficacious than either of the other two drugs. The chemotherapeutic index, i.e., the curative dose as compared with the maximum well tolerated dose, was, in the case of "B.R.68" 1 : 25, in tryparsamide 1 : 2, in atoxyl 1 : 1, for the strain "Prowazek," and 1 : 5–6·6, and 0–1 : 1, respectively for the arsenic resistant strain "30." Reference is made to the fact that the experiments of RÄTH with nagana infected rabbits are, so far as they go, in agreement with the above observations. The authors point out that it cannot be assumed the drug will prove useful in man, and they refer to arsenophenylglycin which in mice is most active, and yet on account of certain undesirable effects cannot be used clinically.

W. Y.

DUNNING (Fitzgerald) & MACHT (D. I.). **Azo Dyes containing Antimony in the Treatment of Trypanosomiasis.**—*Jl. Pharm. & Experim. Therap.* 1928. Jan. Vol. 32. No. 3. pp. 205–213. [11 refs.]

In previous papers, the preparation of a series of azo dyes containing antimony, derivatives of stibanilic acid, was described. Since then several other similar preparations have been made. The trypanocidal power of all these compounds has been tested. Rats infected with *T. equiperdum* were used. This paper, which is of a chemical nature, should be consulted in the original by those who are interested.

Whilst many of the compounds exhibited no trypanocidal properties, certain derivatives were found to be to some extent trypanocidal. The results hitherto obtained indicated that several compounds worthy of more thorough examination had been obtained, but they did not permit of any positive assertions concerning the practical use of these compounds in the treatment of trypanosomiasis.

W. Y.

SCHNITZER (R.) & SILBERSTEIN (W.). Untersuchungen zur Chemozeptorentheorie. VI.Mitteilung. Der "Sulfhydryl-Chemozeptor." Seine Beziehungen zum Interferenzphanomen. [**Investigations into the Chemoreceptor Theory. The "Sulphydryl-Chemoreceptor" and the Interference Phenomenon.**]—*Ztschr. f. Immunitätsf. u. Experim. Therap.* 1927. Dec. 5. Vol. 53. No. 5/6. pp. 439–461. [4 refs.] ["Robert Koch" Inst., Berlin.]

Reference is made to previous papers on this subject by the authors and by BROWNING and GULBRANSEN [this *Bulletin*, Vol. 19, p. 882 and Vol. 24, p. 571 and p. 965].

The following summary of the present communication is given :—

Experiments on the inhibition of the trypanocidal action of tartar emetic and oxy-aminophenylarseno-oxide by sodium thioglycolate have given the following results :

1. Mixing of the agents *in vitro* and testing of the mixture as regards toxicity for mice and trypanocidal action in nagana infection of mice.

(*a*) Tartar emetic : very quickly arising extensive poisoning, but no arresting of the trypanocidal power. This is first appreciable after the agents have acted on one another for 24 hours.

(*b*) Arseno-oxide : poisoning after 1–3 hours contact. Complete arrest of the trypanocidal action apparent after contact for 1 hour.

(*c*) *In vitro*. No inhibition of the trypanocidal action is seen in the case of tartar emetic and arseno-oxide, when the arrest of the infectivity for mice is chosen as the test.

2. Separate administration of sodium thioglycolate and tartar emetic or arseno-oxide, with or without an interval :

(*a*) Tartar emetic : no toxic effect, but considerable limiting of the trypanocidal action.

(*b*) Arseno-oxide : no toxic effect, but great inhibition of the trypanocidal action.

Comparison of the various observations on the influence of the toxicity and trypanocidal action of tartar emetic and arseno-oxide, both in regard to the views developed by Voegtlin and his collaborators on the one hand, and to those of the authors on the other, show that the sulphydryl groups of the protoplasm cannot be regarded as the chemically defined chemoreceptors of the arsenicals. Toxicity on the macro-organism and specific chemo-therapeutic action on the trypanosomes must be considered to be different processes. The inhibition of the trypanocidal action through sulphydryl-containing compounds is allied to the " interference phenomenon " and is associated with a binding of the—not trypanocidal—inhibiting agent on the trypanosome cell. A modification of the respective chemoreceptor systems is bound up with this, which finds its expression in a loss of action of the trypanocidal agent.

W. Y.

Siberstein (W.). Untersuchungen zur Chemozeptorentheorie. VII. Mitteilung. Biologisches Verhalten der Trypanosomen im Interferenzversuch. [**Investigations into the Chemoreceptor Theory. VII. Biological Behaviour of Trypanosomes in the Interference Experiment.**]—*Ztschr. f. Immunitätsf. u. Experim. Therap.* 1928. Jan. 16. Vol. 54. No. 3/4. pp. 324–334. [11 refs.] [" Robert Koch " Inst., Berlin.]

The following summary is given :—

1. With the combined administration of sodium thioglycolate and tartar emetic in trypanosome-infected mice, and also with other known conditions of interference experiments, there appear in instances of incomplete interference, i.e., where the trypanocidal action is not entirely inhibited, three types of infection which deviate from the normal :—

i. Early relapse.
ii. Intermittent infection,
iii. Continuous infection.

2. In the early relapse and intermittent infections, the relapse strain is always different from the original strain, and in the continuous infections it is very frequently so.

3. The biological modification of the strain is due to the combined action of chemical and immune powers whereby a special significance

devolves upon the relapse bodies (Rosenthal). The close relationship between chemo- and immune-receptors is considered to be in accord with the conception of complex chemoreceptors (primary binding nuclei).

W. Y.

Reichenow (E.) & Regendanz (P.). Ueber die Flohpassage normaler und mit Arsenophenylglycin vorbehandelter Rattentrypanosomen. [**The Flea Passage of Normal Rat Trypanosomes and of those previously treated with Arsenophenylglycin.**]—*Abhandl. a.d. Gebiet d. Auslandskunde. Hamburg. Univ.* 1927. Vol. 26. (D., Med. & Vet. Vol. 2.) [Festschrift Nocht.] pp. 446–460. [15 refs.] [Inst. for Ship & Trop. Diseases, Hamburg.]

In these experiments the authors have investigated the behaviour of a strain of *T. lewisi*, previously treated with arsenophenylglycin, after natural transmission by means of fleas. The first part of the paper is concerned with certain observations on flea passage of the parasite. As the result of a number of preliminary experiments, it was found that 18° C. is the lowest temperature at which *T. lewisi* will develop in the flea's intestine. Support was also obtained for the contention of Minchin and Thomson that only a small proportion of the trypanosomes taken up by the flea can undergo development in the intestine. The occurrence of flea infection is thus dependent on a heavy rat infection and on atmospheric temperature. It was further found that the rapidity with which development occurred in the flea's intestine depended on temperature and that the intensity of the infection varied with that of the blood of the rat upon which the flea was fed.

Details are given in a table of 26 experiments in which an attempt was made to infect rats by feeding them with the infected faeces of fleas. In 15 of these the rats became infected. It was determined that the infectivity of the flea's faeces for rats depended directly on the number of parasites contained. It was noticed, however, that not all of the rats which had received even the greatest number of parasites became infected. Since all the rats did not lick fresh faeces from their body, it is possible that in a proportion of cases the bites of the fleas might play a part. The incubation period in natural infections is rather longer than in infections produced by inoculation of blood. The natural infection differs strikingly from that produced by inoculation of blood: in the former the period of multiplication of the trypanosomes lasts much longer, so that the number of parasites found in the blood is much greater. In inoculated infections division forms are found on only one or at most two days, whilst in natural infections they are usually found for at least four or five days. A similar state of affairs is found in blood inoculations into rats which have been splenectomized.

Passing to the second portion of their work, viz., the influence of flea passage on the susceptibility of *T. lewisi* to arsenophenylglycin, the authors first of all decided to determine the action of the drug on a normal strain of *T. lewisi*. It was found that the curative dose at the time when the trypanosomes possessed the greatest power of resistance, i.e., when the multiplication period was over and the number of parasites in the blood was very great, was ·17 gm. per kilo of body weight, whilst in cases where the number of trypanosomes was

less or during division smaller doses sufficed. But even small doses brought the multiplication processes to an end within 24 hours.

The authors describe their attempts to produce a strain of *T. lewisi* resistant to arsenophenylglycin. Their success was, however, only slight and the most they succeeded in doing was to obtain a strain which in certain mice resisted as much as ·2 gm. per kilo of the drug. They then proceeded to enquire whether this slight increase in resistance to arsenophenylglycin was lost after passage of the trypanosome through the flea, or whether its susceptibility to the drug was in any way changed. A number of experiments were made and the results are set forth in tables. The first experiment was performed with a normal strain of *T. lewisi* obtained from a previously untreated Rat 14. Four fleas were infected from this rat and three other rats, Nos. 2, 4 and 6, then infected from the fleas' faeces. It was found that two injections of ·13 gm. per kilo of the drug sufficed to clear the parasite from the blood of Rat 14, but that Rat 2 resisted two similar injections, and Rats 15 and 16 resisted one injection of ·15 gm. per kilo, but were cured by a second injection of ·2 gm. per kilo. The authors state that these results are very similar to those obtained in experiments where the transference of the parasite was by blood inoculation; and they conclude that the flea passage exerts no influence one way or the other on arsenic resistance. As the results of the two experiments performed with slightly resistant arsenophenylglycin-resistant strains, the authors conclude that passage through the flea had no definite effect on the strain. [The reviewer is of opinion that in these experiments, as in the case of Duke's, the increase in arsenic resistance of the strain employed was so slight that it is hardly safe to form any definite conclusion from them.]

W. Y.

Levaditi (C.) & Delorme (M.). Mécanisme pathogénique des accidents nerveux tardifs des trypanosomiases. [**Pathogeny of Late Nervous Symptoms in Trypanosomiasis.**]—*C.R. Soc. Biol.* 1928. Jan. 4. Vol. 97. No. 36. pp. 1693–1695.

Rabbits were injected, by sub-occipital puncture, with the blood of mice containing numerous *T. brucei*; the injections were repeated at various intervals. The authors determined, among other facts, the fate of the injected parasites both by direct observation and by injection into mice, their appearance in the circulation, the trypanocidal power of the blood and of the cerebro-spinal fluid, and the resistance to antibody of the flagellates isolated from the spinal fluid.

The trypanosomes introduced into the subarachnoid cavity of fresh rabbits persist in the spinal fluid about 5 days and then disappear suddenly. A veritable crisis occurs comparable to that seen in the blood. The parasites invade the general circulation from the commencement.

The parasites of the first re-inoculation given some days after the crisis disappear the day after the injection and their disappearance is accompanied by a marked local leucocytosis. This fact proves that the nervous system, and its annexes, participate rapidly in the state of immunity acquired by the whole organism. The phenomenon of "neuro-immunity" appears each time that the flagellates are re-inoculated into the cerebrospinal fluid and during all the period which precedes the stage of cachexia. When this period is established and

one observes at times nervous phenomena, such as rigidity and contractures, the refractory state of the nervous system and its annexes seems to give way. Trypanosomes inoculated subdurally now persist for a long time in the subarachnoid space. In animals which succumb or are killed at this stage trypanosomes can be demonstrated in the nervous system by sub-inoculation into mice, although the circulation may be free from them.

Neuro-immunity is due to trypanolytic antibody which causes *in vitro* definite lysis of the organisms and their attachment to leucocytes. The antibody appears simultaneously in the cerebro-spinal fluid and in the blood, so that it is impossible to state where it is elaborated. The trypanosomes isolated from the cerebrospinal fluid during the period of neuro-immunity are found to be partially antibody resistant. The injection of the flagellates into the blood may be followed by their appearance in the spinal fluid as shown by subinoculation of mice. The animals injected in this manner behave as do those inoculated subdurally, with the difference that the immunity of the nervous system in the latter is more marked than in the former.

W. Y.

KLIGLER (I. J.). **Relation of Temperature to Susceptibility of Host to Disease.**—*Proc. Soc. Experim. Biol. & Med.* 1927. Oct. Vol. 25. No. 1. pp. 20–21. [1 ref.] [Dept. of Hygiene, Hebrew Univ. Jerusalem.]

Reference is made to a previous paper [this *Bulletin*, Vol. 24, p. 575] in which it was shown that insolation or immersion in water for short periods lowers the resistance of guineapigs to a trypanosome infection. As insolation produced a rise in body temperature of 1·5° C. and immersion a fall of 2·5° C., it was possible that the effect might be referable to temperature changes. The experiments described in this paper were therefore undertaken to ascertain the effect of low and high environmental temperatures on the relative susceptibility of animals to infection. White rats of the same age and weight were injected intravenously with the same dose of trypanosomes (*T. evansi*) and divided into two groups. One set was placed in a dark room at 28°–30° C. and relative humidity of 45, and the other in a similar room at 10°–12° C. and relative humidity of 70 to 80. The results of the experiments indicate that temperature has no effect on the course of the trypanosome infection in rats ; the effect in guineapigs is now being investigated.

W. Y.

KLIGLER (I. J.) & RABINOWITCH (G.). **Susceptibility and Resistance to Trypanosome Infections. III. The Relation of Dosage to the Course of Infection.**—*Ann. Trop. Med. & Parasit.* 1927. Oct. 10. Vol. 21. No. 3. pp. 375–380. [4 refs.] [Dept. of Hyg., Hebrew Univ., Jerusalem.]

The purpose of the experiments described in this paper was to ascertain the effect of dosage on the course and duration of a trypanosome (*T. evansi*) infection. The rat proved to be a more satisfactory gauge than the guineapig, because the disease is of short duration and progresses steadily as an acute infection with fatal termination. In both animals the acuteness and speed of the onset

of the infection may be controlled by the size of the infecting dose. In the guineapig a dose of 50 or 100 million trypanosomes shortens the incubation period to one day, while the injection of 100 trypanosomes results in an incubation period of fourteen days. In the rat animals of the same age and weight receiving 1,000 organisms will live on an average one and a half to two weeks longer than those receiving a million. The smaller the dose the greater is the possibility of the factors of native individual resistance coming into play. Not only is the dosage *per se* important, but the dose in relation to age or, in these animals, body weight, is most significant. Animals of different weight receiving the same number of organisms react entirely differently, the smaller animal succumbing, as might be expected, much sooner than the larger ones. Differences only become appreciable when the doses vary by multiples of 100 or 1,000.

W. Y.

Mutermilch (S.) & Salamon (E.). Contribution à l'étude du mécanisme de la création des races des trypanosomes du nagana anticorps-résistantes. [**Mechanism of the Creation of Races of Nagana Trypanosomes Resistant to Antibodies.**]—*C.R. Soc. Biol.* 1928. Feb. 10. Vol. 98. No. 5. pp. 345–347. [4 refs.] [Pasteur Inst., Paris.]

Reference is made to the fact that in experimental nagana infection of the guineapig inoculation into the peritoneum is followed by the appearance of parasites in the blood, where they multiply for four or six days ; they then disappear suddenly from the general circulation, only to reappear some days later. The disappearance of the trypanosomes coincides with the appearance of lytic properties of the serum, and the trypanosomes which relapse are resistant to the action of such serum.

Two hypotheses have been advanced to explain the curious phenomenon of the strains of trypanosomes antibody resistant. (1) That of Moore and Breinl (1907), who describe latent bodies from which, by a process of sexual evolution, new flagellates are formed ; and (2) that of Levaditi and Mutermilch (1909), who believe that it is the result of a simple selection of a few trypanosomes gifted with a natural immunity to the antibody, and that these individuals, after having resisted the lytic action of the serum, give rise to the new strain of resistant trypanosomes. As the result of filtration experiments on (a) mixtures of trypanolytic sera and trypanosomes, and (b) organ extracts obtained during the crisis, the authors have reached the conclusion that the relapses in the guineapig are not due to ultramicroscopic resistant bodies, but to a simple selection as was conceived by Levaditi and Mutermilch.

W. Y.

Mutermilch (S.) & Salamon (E.). Contribution à l'étude du mécanisme de la crise chez le cobaye trypanosomié. [**Mechanism of the Crisis in the Trypanosome-infected Guineapig.**]—*C.R. Soc. Biol.* 1928. Feb. 10. Vol. 98. No. 5. pp. 348–350. [2 refs.] [Pasteur Inst., Paris.]

According to Massaglia and others, trypanosomes during the crisis in the guineapig take refuge in several of the organs and are

found in the greatest number in the haematopoïetic organs. In order to verify this statement, the authors sacrificed a considerable number of guineapigs during the crisis, from the moment of disappearance of the flagellates from the general circulation up to the moment of relapse. The animals were killed by puncturing the heart and withdrawing from it 25 cc. of blood. A small portion of 2–3 cc. was immediately defibrinated and the rest was allowed to clot. Pieces of the organs—liver, spleen, and bone-marrow—were then ground up with ten times their volume of simple bouillon. From these original emulsions, dilutions up to 1 in 1,000 were prepared, as were also dilutions of the defibrinated blood. Equal portions of all of these dilutions were injected into mice, in order to follow the development of the infection in these animals. It was found (1) that the organ extracts were, in the great majority of cases, virulent, (2) that the blood was always distinctly more virulent than the organ extracts, and that the virulence of the extracts would probably be explained by the small amount of blood they contained. From work of this sort it is concluded that the organs did not serve as a place of refuge for the trypanosomes during the crisis, and that the trypanosomes did not entirely disappear from the general circulation at the commencement of the crisis.

The question whether the trypanosomes become antibody resistant at the commencement of the crisis or whether their selection is a continuous process is next considered.

Experiments suggest that the latter is probably the correct explanation. It was further found that the trypanolytic antibody increased progressively from the first to the fourth stage of the crisis and then remained stationary until the relapse. The mechanism of the crisis in guineapigs infected with trypanosomes is believed to be as follows : After a septicaemia lasting four to six days, specific antibodies, secreted by the haematopoïetic organs, appear suddenly in the general circulation ; the amount is at first minimal and suffices to destroy all the most sensitive parasites. The fresh quantities of lytic antibody which continue to be poured into the circulation destroy progressively the less resistant parasites, and finally only those which have a natural resistance survive. These multiply and give rise to the relapses. The internal organs do not serve as a place of refuge for the trypanosomes nor do there appear to exist in the course of the crisis filtrable forms of the trypanosomes.

W. Y.

Cordier (G.). Etude de quelques propriétés physiques du sérum d'animaux atteints de trypanosomiase. [**Study of Physical Properties of the Serum of Animals infected with Trypanosomes.**] —*C. R. Soc. Biol.* 1928. Feb. 3. Vol. 98. No. 4. pp. 315–316. [Arloing Inst., Tunis.]

The author has studied some of the physical properties of the serum during the course of trypanosomiasis in various animals. The animals used were horses, donkeys, mules and sheep, and they were infected with *T. equiperdum* or a trypanosome from Morocco. The examinations made were (1) The viscosity determined by the viscosimeter of Hess, (2) The superficial tension determined by means of Tate's

formula, (3) The pH by the colorimetric method, and (4) The formol-gel reaction. The results are given in tables. It was found that the viscosity, and the pH, in dourine increased as the disease developed ; the superficial tension increased during the periods of oedema.

In the animals infected with the Moroccan strain the results were irregular.

W. Y.

NATTAN-LARRIER (L.) & LÉPINE (P.). Etude comparative de l'action sur les trypanosomes du sérum de la mère et de celui de l'enfant nouveau-né. [**Comparative Study of the Action on Trypanosomes of Sera of Mother and New-Born Baby.**]—*C.R. Soc. Biol.* 1927. Dec. 2. Vol. 97. No. 33. pp. 1470–1472.

The maternal blood was obtained from a vein of the arm at the time of delivery, and that of the new-born child from the cord. The blood was then allowed to clot on ice for 36 hours. In each experiment nine mice were used ; each was given a definite amount of nagana infected blood, one animal then served as a control, 4 were treated 24 hours later with the maternal serum, and 4 with the foetal serum : the amount of serum given to each of the 4 mice was respectively 1 cc., 0·5 cc., 0·25 cc. and 0·1 cc.

In all, the sera of 12 women and 12 new-born children were tested in this way. The broad results were that the maternal serum exhibited definite therapeutic action, sometimes even when employed in the smallest doses of ·1 cc., whereas the foetal serum was much more rarely active and its curative power much more feeble. Furthermore, there was no parallelism between the activity of the various foetal sera and that of the maternal sera.

From this work it is concluded that the substances of human serum, which act on *T. brucei*, are not capable of passing from the maternal blood to that of the foetus.

W. Y.

NATTAN-LARRIER (L.), LÉPINE (P.) & MAY (J.). Recherche de l'alexine et des anticorps naturels dans le lait de la femme. [**Search for Alexin and Natural Antibodies in Woman's Milk.**]—*C.R. Soc. Biol.* 1927. Dec. 2. Vol. 97. No. 33. pp. 1472–1474. [1 ref.]

The authors have examined the milk of 25 women obtained under the best conditions within the first few weeks following delivery. The specimens were allowed to stand on ice for 20 hours and then centrifuged, the fluid thus obtained being used in the experiments.

No evidence of alexin was detected in any of the specimens nor was any trace of haemolysin discovered. Finally, the samples were examined for the presence of anti-trypanosomal substance which is present in normal human serum : here again the result was negative.

W. Y.

NATTAN-LARRIER (L.). L'hérédité de la maladie de Chagas. [**Heritability of Chagas' Disease.**]—*Bull. Acad. Méd.* 1928. Jan. 17. Year 92. 3rd Ser. Vol. 99. No. 3. pp. 97–99.

CHAGAS drew attention to the fact that American trypanosomiasis was very common in children under one year of age, and that the parents of these children suffered from goitre or from the cardiac

form of the disease. Possibly this was due to the fact that they lived in houses infested by Conorhinus, but it also raised the question whether the disease might not be hereditary. Then came VIANNA'S discovery of the parasite in the ova, in the seminiferous tubules, in the spermatic fluid, and even in the spermatozoa. It is, however, simpler to suppose that the parasite traversed the placenta from the blood of the mother to the foetus. NÄGLER in 1913 unsuccessfully sought the parasite in the blood of the young of two infected mice. The author, however, has succeeded in demonstrating experimentally in the guineapig that the virus is transmitted by heredito-contagion. He found the trypanosomes in the blood of the young of two of eleven infected females, and in two other cases the amniotic fluid was found to contain *T. cruzi*. CHAGAS a little later demonstrated hereditary transmission of the parasite in a new-born child. How the parasites traverse the placenta is unknown. In order to investigate the problem, the author has studied the histology of the placentas of his infected guineapigs. He never found any evidence that the trypanosomes in the flagellate stage succeeded in passing the plasmodial layer directly to the foetal vessels. But on numerous points the plasmodial bands which limit the maternal vessels contained the rounded multiplication forms of the parasite. The multiplication and invasion of neighbouring areas resulted in masses 600μ to 700μ in diameter. These masses were rounded, but badly delimited and never encysted; they consisted of innumerable trypanosomes in the rounded or ovoid form. No trace of placental tissue persisted in these masses, but into them and more particularly into their periphery ran foetal vessels which remained permeable, although their endothelial walls abutted directly on the trypanosomes which surrounded them on all sides. The maternal vessels were no longer recognizable in the centre of the nodule, but they remained quite distinct at its boundary, where their lumen stuffed with parasites is delimited by plasmodial bands still intact. It is in these masses and especially at their periphery that the parasites penetrate into the foetal circulation.

W. Y.

DE FARIA (Gomes) & CRUZ, fils (Oswaldo). Sur l'existence d'un stade évolutif intracellulaire du *Trypanosoma cruzi* dans la *Triatoma megista* Burm. [**An Intracellular Stage of *T. cruzi* in *Triatoma megista*.**]—*C.R. Soc. Biol.* 1927. Nov. 18. Vol. 97. No. 31. pp. 1355–1357. With 3 text figs. [Oswaldo Cruz Inst., Rio de Janeiro.]

Acting on the suggestion of CHAGAS, the authors examined a dozen specimens of *Triatoma megista* experimentally infected with *T. cruzi*. In addition to the forms which have already been described by CHAGAS, BRUMPT, and others, the authors discovered intracellular forms localized in the posterior part of the intestine. These were, for the most part, leishmaniaform, but, more rarely, trypanosome forms were also discovered; these were long and delicate, with an elongate band-shaped nucleus and with a blepharoplast immediately behind the nucleus or near the posterior end of the parasite. Sometimes masses of parasites were discovered similar to those observed in the case of *T. lewisi*, but the spheres described by MINCHIN and THOMSON in the latter infection were not encountered.

W. Y.

Campos (Ernesto de Souza). Paralysia experimental determinada pelo *Trypanosoma cruzi* de origem humana. [**Experimental Paralysis caused by *T. cruzi* from Man.**]—*Bol. Biol.* S. Paulo. 1927. Sept. 15. No. 9. pp. 153–173. [170 refs.] English summary p. 156. With 4 figs. [Microb. Lab., Faculty of Med., São Paulo, Brazil.]

The author has studied several cases of experimental paralysis in dogs and mice infected with the strain of *Trypanosoma cruzi* obtained from an armadillo. The lesions and symptoms were similar to those previously described with strains of this parasite obtained from other sources. It is stated that after cultivation for a year the parasite lost its virulence and electivity for the nervous tissue. Similar lesions were found in dogs infected with a strain of *T. cruzi* obtained from an acute human case.

W. Y.

Niño (Flavio L.). Schizotrypanosis experimental en el gato. [**Experimental Infection of the Cat with *Trypanosoma cruzi*.**]—*Bol. Inst. Clin. Quirúrg.* Buenos Aires. 1927. Vol. 3. Nos. 21–25. pp. 372–382. With 7 text figs. & 2 coloured figs. on 1 plate. [14 refs.] [Also issued as *3a Reunión Soc. Argentina Patol. Regional del Norte, Tucumán, Julio, 7, 8 y 10, 1927.* pp. 264–274 & illustrations.]

Natural infection of the cat by this parasite has been recognized, but the present account is of a cat inoculated with the intestinal contents of infected *Triatoma infestans*. The progress of the resulting disease was very slow; the parasites were not seen in the peripheral blood for 10 weeks after inoculation, and the whole course was 15 months. The chief symptom is a slowly developing paraplegia, without involvement of the sphincters; there is marked mydriasis explained by the fact that the main site of damage in the spinal cord is the cervical enlargement. Aggregations of the leishmanial forms are commonest in the psoas and the diaphragm. A leptomeningitis with haemorrhagic spots is present over the cerebral hemispheres and a pachymeningitis over the cervical enlargement, with dilatation of the central canal, a periependymal inflammation and sometimes blood-stained fluid in the interior. Coloured plates and good microphotographs illustrate the histological changes.

H. Harold Scott.

Lacorte (José Guilherme). [In Portuguese & English.] A reacção do desvio do complemento na Molestia de Chagas. **The Complement-Fixation Test in Chagas' Disease.**—*Mem. Inst. Oswaldo Cruz.* 1927. Vol. 20. No. 2. In Portuguese pp. 197–210. With 38 figs. on 18 plates. In English pp. 211–224. [3 refs.]

The author performed a complement-fixation test in two hundred suspected cases of Chagas' disease; a Wassermann test was also made simultaneously in all the cases. An account of the technique used is given. The following is a summary of the results:—

"It is our purpose in publishing the present paper to make clear the possibility of diagnosing Chagas' disease by means of the Bordet and Gengou complement-fixation reaction, for the following reasons:—

"1. In 200 cases suspected of being Chagas' disease selected among those attending the hospital at Lassance, the test was practised with 159 positive results, which gives a high total percentage of 79·5 per cent.

" 2. In the cases of the cardiac form 87·2 per cent. of positive results were obtained out of a total of 39 reactions. This is the form which most favours diagnosis whether by this or other means.

" 3. In the case of subjects affected only with thyroid lesions, mostly of goitre, 79·5 per cent. positives were obtained in a total of 119 reactions. It would seem to me that this is a great argument in favour of the hypothesis expressed by the discoverer of the disease, in favour of endemic goitre of this and probably of other regions being caused by *Trypanosoma cruzi*.

" 4. In the cases of the nervous form 100 per cent. positives were obtained in a total of 6 reactions.

" 5. In those of glandular form 75 per cent. positive results were obtained in a total of 8 reactions.

" 6. In those of undetermined form 25 per cent. in 8 reactions.

" 7. All these patients were submitted at the same time to the Wassermann reaction. With serum from the same puncture and under the same conditions except as regards antigen, 17 per cent. positive reactions were obtained. In 13 per cent. both reactions gave positive results. Most of the patients with a positive Wassermann showed evident syphilitic lesions.

" 8. The specificity of the reaction was always evident. In 16 sera of normal subjects, in 2 sera of patients with malaria and in 3 patients with ulcers, influenza and rheumatism, used as control, the reactions were in all cases negative, thus confirming the works of Guerreiro, Machado, Villela and Bicalho.

" The antigen which gave the best results was that prepared with the spleen of a puppy well infected with *Trypanosoma cruzi*, whilst that of spleen and heart proved to be a little inferior."

[It will be noted in (1) of the author's summary that the tests were made upon " cases suspected of being Chagas' disease " and the results are not correlated with the finding of trypanosomes or other *proof* of the existence of the disease.

In (3) thyroid lesions are first assumed to be due to trypanosome infection and then the fact that many of them gave a positive serological reaction is stated to uphold the assumption. No evidence is given that these goitre cases should not really be counted among the rather scanty controls which would upset the whole argument.]

W. Y.

LAVIER (G.). Particularités du noyau chez les trypanosomes du groupe brucei, d'isolement récent. [**Peculiarities of the Nucleus in *T. brucei* recently Isolated.**]—*C.R. Acad. Sci.* 1927. Dec. 5. Vol. 185. No. 23. pp. 1325–1327. With 1 text fig.

Whilst a member of the International Sleeping Sickness Commission in Uganda, the author had occasion to study a number of strains of trypanosomes belonging to the *brucei* group (*T. gambiense*, *T. rhodesiense* and *T. brucei*) and all recently isolated. Under these conditions the flagellates differ somewhat from the classical descriptions which are often based on strains conserved in European laboratories. In this note the author deals with the nucleus.

The karyosome can be clearly seen by vital staining of the parasite with a solution of pyronin, 1 in 2,000 of normal saline: other dyes reveal the same structure. The author next deals with the posterior displacement of the nucleus, which, he states, is not characteristic of

T. rhodesiense and *T. brucei*, but may also sometimes be seen in *T. gambiense*. He gives a brief explanation of this phenomenon along the lines of a previous paper [this *Bulletin*, Vol. 24, p. 952].

The interesting observation is recorded that in certain conditions of infection in the guineapig trypanosomes were encountered in which there was no nucleus. This was not the result of artefact, the individuals in question were intact and their neighbours were well coloured; moreover, their appearance shows clearly that they were living at the moment of fixation. Their cytoplasm is generally pale and exhibits few, if any, inclusions. They can be encountered easily with a little patience at certain periods of the infection in the guineapig, when the divisional forms are particularly numerous and atypical. These a-nuclear forms have been seen in *T. brucei* and *T. rhodesiense*, but not yet in *T. gambiense*, although Lavier believes they will eventually be found also in infections due to this parasite. Lavier explains this phenomenon on the assumption that in periods of intense division the necessary synchronism in the division of the organism for the production of two complete new individuals may not occur. If there be any delay in the division of the nucleus one of the daughter individuals has no nucleus. Such forms may live for a short period.

W. Y.

Lavier (G.). Existence d'individus naturellement "ablépharoplastiques" dans les souches de trypanosomes du groupe *brucei* récemment isolées. [**Blepharoplastless Individuals in Strains of *T. brucei* recently Isolated.**]—*C.R. Soc. Biol.* 1927. Dec. 16. Vol. 97. No. 35. pp. 1611–1613. [Internat. Sleeping Sickness Commission, and Parasit. Lab., Faculty of Med., Lille.]

While studying seven recently isolated strains of *T. gambiense*, two of *T. rhodesiense* and four of *T. brucei*, the author has seen in all a certain number of individuals in which the parabasal body was lacking. In other words, to use a bad expression, "blepharoplastless trypanosomes." These forms may occur in the naturally-infected host, but in man the author has never encountered sufficiently numerous trypanosomes to have a chance of discovering them. They are also found in experimental infections whatever the species infected, e.g., dog, guineapig, rat and monkey. In experimental infections they appear a little after the first trypanosomes. Their number then increases rapidly for some days until a state of equilibrium results, which persists indefinitely till the death of the animal. Subinoculation does not increase the number of these forms; on the contrary it may lead to their progressive disappearance. The forms involved may be either short, long or intermediate trypanosomes. They can divide giving rise to blepharoplastless individuals. They do not seem to be influenced by trypanolytic crises more than normal individuals. A certain number of them may result from atrophy of the parabasal body, which, in recently isolated strains, exhibits very great variations in size, but most certainly the greater portion of them are produced during division. In periods of intense division the necessary synchronism for the formation of two complete individuals may be lacking and a retardation of division of the parabasal body may result in two new individuals, one of which possesses a parabasal and the other

lacks it. The point of equilibrium appears to vary not only in different strains, but in the same strain, and blepharoplastless individuals may form anything from 0·5 to 10 per cent. of the total number of parasites.

W. Y.

LAVIER (G.). Sur la structure du corps parabasal des trypanosomes. [**Structure of the Parabasal Body of Trypanosomes.**]—*C.R. Acad. Sci.* 1927. Dec. 19. Vol. 185. No. 25. pp. 1534–1535.

Various researches have shown that the body, in the Herpetomonadidae, named micronucleus, kinetonucleus and blepharoplast, is neither of the nature of a nucleus nor a true blepharoplast, but ought to be considered as analogous to the parabasal apparatus of JANICKI in the Hypermastigina and Polymastigina.

The author's investigations on trypanosomes belonging to the *brucei* group have thrown some light on the structure of this body. In living preparations it is invisible and what one sees is the vacuole which accompanies it ; but the parabasal body is easily seen on vital staining. In ordinary dry and wet fixed preparations the general appearance is the same, viz., a strongly chromophilic body surrounded by a more or less pronounced halo. But in preparations fixed with Flemming's solution without acetic acid, treated with bichromate of potash and stained with iron haematoxylin, the appearance is different : the body stained is definitely more voluminous. These observations lead one to consider the parabasal body of the trypanosomes as formed of a chromophilic nucleus, resistant to alcohol and acetic acid, and surrounded by a chromophobe cortical zone extremely sensitive to acids and alcohol.

The true blepharoplast or basal granule is situated in contact with the parabasal body, except at the time of division when it is definitely separated from the parabasal body. In trypanosomes of the *brucei* group the size of the parabasal is extremely variable ; sometimes it is very large, but often it is obviously atrophied, and finally in a certain proportion of instances it is completely absent.

W. Y.

LAVIER (G.). Sur la vacuole prébasale des trypanosomes. [**The Prebasal Vacuole of Trypanosomes.**]—*C.R. Acad. Sci.* 1928. Jan. 9. Vol. 186. No. 2. pp. 106–108. [1 ref.]

Although the existence of a vacuole in front of the parabasal body has been recognized for a long time and has frequently been figured, but little is known about it. It cannot be an artefact, as it is clearly seen in the living parasite in certain instances when it is of sufficient size. Sometimes it is hypertrophied, bulging the two sides of the trypanosome and lenticular when seen in profile. Often the existence in its interior of a longitudinal filament can be seen, and rarely in place of this filament are one or more granules. All attempts at vital staining proved failures, but after fixation and staining the same appearances were disclosed as were seen in the living parasites. The vacuole itself remains unstained and the axial filament is frequently to be seen ; sometimes it is prolonged anterior to the vacuole and reaches as far as

the nucleus and even beyond it. Exceptionally two or even four parallel filaments are present in the vacuole. In contact with the vacuole and applied to its posterior pole is the basal granule. The flagellum, which in part does not traverse the vacuole, but turns anteriorly in its vicinity, is sometimes applied to its surface. The prebasal vacuole is generally round and its size varies considerably independently of that of the trypanosome. During division of the parasite it does not divide, but a new one is developed shortly after the appearance of the second flagellum.

The vacuole cannot be considered as appertaining to the parabasal or as secreted by it, since it is present in "blepharoplastless" individuals. Possibly it is formed by the basal granule, or possibly it is completely independent of this. The author believes that its rôle is secretory, because chromophilic granules often appear at its periphery, and he considers that the variations in its size are due to variations in its activity.

W. Y.

Lavier (G.). Les formations paravacuolaires des trypanosomes. [**Paravacuolar Formations of Trypanosomes.**]—*C.R. Acad. Sci.* 1928. Feb. 6. Vol. 186. No. 6. pp. 401–403.

Reference is made to the fact that in certain trypanosomes and particularly those of the *brucei* group chromophilic granules occur in the cytoplasm. Hindle and Swellengrebel showed long ago that, although most of the granules are composed of metachromatin or volutin, a certain number are of a different nature; these are stainable with haematoxylin and are localized between the kinetonucleus and nucleus. In his observations on the character of these granules Lavier found that in blood films, stained by the panoptic method, they stained a purple-violet colour similar to that assumed by metachromatin, from which they could only be distinguished by their localization at the periphery of the prebasal vacuole and especially at its anterior pole. Although, however, they are chiefly paravacuolar they may extend anteriorly towards the nucleus; sometimes they are arranged in a row, but at other times they are grouped in a rosette or scattered irregularly, and at other times again they may be present in considerable number and invade the whole flagellate.

These granules can be differentiated from the metachromatin particles by fixing in methyl alcohol and then immersing in warm water—a proceeding which immediately dissolves the metachromatin. In wet-fixed preparations the metachromatin dissolves in the fixative, whereas the paravacuolar formations persist even in the presence of considerable quantities of acetic acid and are stainable with haematoxylin. Vital staining also allows of the differentiation of the two kinds of granules.

The conditions which determine the appearance of the metachromatin and paravacuolar formation are quite different; for the former the host infected by the trypanosome is important, whereas for the latter this has no effect. They are particularly numerous in those individuals the vitality of which is obviously injured; e.g., in crises which are terminated by cure the trypanosomes may be absolutely crammed with granules. Under these circumstances there is a noteworthy

hypertrophy of the prebasal vacuole. Lavier considers that the paravacuolar formations are secreted by the prebasal vacuole and not, as suggested by Hindle and Swellengrebel, by the kinetonucleus. Possibly these granules are a product of degeneration of the trypanosomes, but it is also possible that they may be a defensive reaction against unfavourable conditions.

W. Y.

Roskin (G.) & Schichlajewa (S.). Die Teilung des Kerns bei Trypanosomen. [**The Division of the Nucleus in Trypanosomes.**]—*Arb. a.d. Microbiol. Inst. d. Volksunterrichtskomissariats.* 1927. Vol. 3. German summary pp. 390–392. [In Russian pp. 163–180. With 6 figs. & 1 plate.]

The process of nuclear division was investigated in *T. equiperdum*, *T. rhodesiense*, *T. evansi* and *T. brucei*. Wet blood films, after treatment with (1) San-Felice, (2) Fleming, (3) Hermann, (4) Zenker, or (5) 1 per cent. osmic acid vapour, were fixed with sublimate alcohol. Thereafter, without allowing the preparations to dry, they were stained with Haydenhain's haematoxylin and counter stained with eosin or chromotrope or by Unna's or Ikeda's method.

In the resting stage the nucleus is round or oval and in the middle of it is the karyosome, the size of which depends greatly on the physiological condition of the individual. The nucleus is separated from the cytoplasm by a delicate membrane within which, on the periphery of the nucleus, the chromatin is grouped in fine granules or forms a narrow border. The karyosome contains no chromatin in the resting nucleus. Before commencement of division the karyosome increases greatly in size and the chromatin from the periphery of the nucleus becomes grouped round it. The formation of the chromosomes then takes place and one is separated off from the enlarged karyosome. Two chromosomes remain for a time unseparated, but finally they likewise are divided off. In this way there arises a nucleus with three chromosomes. The chromosomes, which at first form a triangle, become arranged in a row and successive cleavage from the mother chromosomes gives rise to daughter chromosomes. The daughter chromosomes become distributed in threes on opposite sides of the nucleus which becomes elongated and gradually separated into two segments. The young daughter nuclei contain three chromosomes which fuse together and form a karyosome from which the chromatin passes to the periphery of the nucleus.

W. Y.

Namikawa (Hiroshi). Ueber das Verhalten von Warmblüter-Trypanosomen im Koerper des Seidenwurmes (*Bombyx mori*). [**On the Behaviour of the Trypanosomes of Warm-Blooded Animals in the Body of Silkworms.**]—*Taiwan Igakkai Zasshi* (*Jl. Med. Assoc. Formosa*). 1927. Sept. No. 270. German summary pp. 8–9. [In Japanese.] [Govt. Research Inst., Formosa, Japan.]

Reference is made to the work of Iwanow (1925) who showed that *T. equiperdum* was still infective for mice after it had been for 11 days in the body of *Galleria melonella*. The author injected silk worms with *T.*

gambiense and *T. lewisi* and kept the silk worms at various temperatures viz., 2°, 4°, 18° and 37° C. It was found that *T. gambiense* remained alive in the silk-worms kept at 2°–4° C. for at least nine days, and that the trypanosomes were infective for mice after three days. *T. lewisi* survived apparently unchanged for at least 8 days in the silk worms and were infective for rats at the end of this period.

W. Y.

Kadaner (M.) & Wallon (R.). Un cas de trypanose chez un Européen. *Bruxelles-Méd.* 1928. Jan. 15. Vol. 8. No. 11. pp. 364–366. [4 refs.]

Neame (Humphrey). Parenchymatous Keratitis in Trypanosomiasis in Cattle and in Dogs, and in Man.—*Brit. Jl. Ophthalm.* 1927. May. Vol. 11. No. 5. pp. 209–216. With 5 text figs. [15 refs.]

MISCELLANEOUS.

TRANSACTIONS OF THE ROYAL SOCIETY OF TROPICAL MEDICINE & HYGIENE. 1927. July 11. Vol. 21. No. 1. pp. 19–38.—A Discussion. **The Organization of Medical Research in the Tropics.** [Openers: STANTON (A.) & YORKE (W.).]

Dr. STANTON, who opened this discussion, said that the term "research" should cover any work which has for its object additions to knowledge of the causation, prevention or treatment of disease, whether done in a laboratory or in the field. The Divisions of the Medical Department under the control of which research is placed are set out schematically, representing Medical, Sanitary, Laboratories and Research, and Medical Education. Laboratories and Research again is subdivided in 4 headings, which are grouped under a Deputy Director of Laboratory Services in touch with other sciences such as veterinary and agricultural research. The whole is under the Director of Medical and Sanitary Services who is linked through the Governor and Secretary of State with the new Colonial Medical Research Committee, which "will endeavour to establish contacts with all the organizations concerning themselves with medical research problems of the tropics in this country . . . and with international organizations." The medical secretary of this new Committee will link up with it various official and unofficial bodies, such as the Royal Society, Schools of Tropical Medicine, etc., and will devote himself to the study of research in tropical diseases. Reference is made to the possibility of a Colonial Research Service.

Professor Warrington YORKE expressed the opinion that far too much is published and suggested that the output of slovenly work could be remedied by some organization devised to encourage and stimulate original investigation and to afford helpful criticism and guidance. He stressed the truth that work is often rendered valueless by defective organization, e.g., the treatment of trypanosomiasis; careful records are published on the drug treatment of natives but their ultimate fate is unknown. The result is a plethora of papers but little real advance in knowledge. He groups the medical investigators in the tropics under three heads: scientific commissions, staffs of laboratories, and isolated workers whose primary work is diagnosis and treatment of disease; it is to the laboratory staffs that we must look for results of value. Every colony should have at least one thoroughly efficient laboratory, and he is against the separation of routine pathological and research work. He criticizes the method of appointment of the staff of such laboratories. He doubts whether it is generally recognized that specialized qualifications are necessary, and points to the importance of a highly trained, enthusiastic director. Seniority in this respect is a snare and delusion. "The appointment to directorships of laboratories should invariably be in the hands of an expert body in this country." As to the junior posts, those who propose entering laboratory service should spend at least a year working in a laboratory in England learning technique, developing their critical faculties and discovering how research is done. "A man must spend years learning how to investigate successfully." These men should have special study leave at intervals and work in European laboratories. The staff of a laboratory must be sufficiently large to ensure continuity of work; breaks may ruin years of investigation.

Sir Leonard Rogers gave details of the organization of research in India. Men who put down their names for the Research Department spend several years of probationership before they are confirmed in their appointment.

Professor Leiper would prefer to the scheme sketched by Dr. Stanton something in the nature of an Imperial Research Service for Agricultural Research with a medical side. If research is subsidiary to the Colonial Laboratory Service, concerned as it is with diagnostic routine, it will remain the Cinderella of the Laboratory. He would like to see medical research associated with education, as in England, and he points out how largely the Medical Research Council depends on the co-operation of University Staffs. "We shall not attain to the ideal of an Imperial Research Service until whole-time research workers, medical, agricultural and veterinary, are grouped together in small communities at a few strategic centres whence selected men can be sent to deal with special problems in the field."

Major-General D. Harvey gave an account of the organization in the Army.

Dr. Manson-Bahr in reference to the mass of published papers and its proposed restriction said that Manson had great difficulty in obtaining publication for his work on filaria and the mosquito. Too great a censorship of medical literature would be an error. He claimed that valuable research work was done in routine laboratories.

Professor C. D. de Langen spoke of the advantage of international organization of medical research; Dr. Chesterman of the opportunities awaiting the researcher in mission hospitals; Mr. M. E. MacGregor advocated a communal Field Research Station in the tropics "where new and veteran workers could gain or renew contact with the many problems still clamouring for attention" and Dr. Wenyon eulogized the stimulus of competition, individual and international.

A. G. B.

Megaw (J. W. D.) & Gupta (J. C.). **The Geographical Distribution of Some of the Diseases of India.**—*Indian Med. Gaz.* 1927. June. Vol. 62. No. 6. pp. 299–313. With 13 maps. [1 ref.]

This paper deals with information supplied, in reply to a questionary, by 240 civil surgeons. The object was to collect in a concise form what is known of the geographical distribution of the more important diseases of India and to call attention to the need for a more accurate survey. The authors recognize that the information supplied is more accurate for some diseases than others. Lathyrism, plague, goitre and others are readily diagnosed clinically; disease such as yaws and G.P.I. will be less generally identified, and in other cases the diagnosis will be in doubt, e.g., dengue or sandfly fever, beriberi or epidemic dropsy. They believe, however, that the information is approximately accurate. Malaria and hookworm are not included in this survey. Maps are given of the distribution of relapsing fever, sandfly fever, dengue, kala azar, filariasis and guineaworm; of osteomalacia, lathyrism and endemic goitre; of leprosy, yaws, blackwater fever and Madura foot. The disease areas are indicated by shading as "common," "very common," "rare" and "unknown." [In the absence of the questionary it is difficult to say where the different civil surgeons drew the line between common and rare and the scale of the maps is obviously too small to show the natural features of the country.]

Under *relapsing fever* the authors call attention to its absence from Bengal, Assam and Burma and its rarity in Bihar and Orissa. *Sandfly fever* is a disease of the north-west and centre of India. *Dengue* has a wide distribution. Knowledge of the distribution of *filarial disease* is said to be exceedingly meagre ; the authors at Calcutta see many cases from a region which according to the civil surgeons is free. Tabulated data are supplied by Sundara Rao for some Provinces. The *guineaworm* records are probably accurate ; there is none in Bihar and Orissa or in provinces to the east thereof. With few exceptions *lathyrism* occurs only in a belt running across the Central Provinces, the east of the United Provinces and the north of Bihar. *Endemic goitre* is seen to be commonest in the districts lying immediately south of the Himalayas and in the hilly regions of Burma and Assam. " The distribution favours an agency of a chemical nature [carried in the streams from the mountains] rather than a bacterial infection." *Leprosy* is distributed generally, but is rare in the Punjab and common in Bombay and Burma and Madras ; it is estimated that the lepers number 2–3 per mille for all India or a half to one million in all. *Yaws* is depicted in a large area in Assam and Burma, 2 smaller in central India and one in the south. *Diphtheria* is reported as present in 146 districts and absent in 37 ; in Calcutta it is known to be very common. *Rheumatic endocarditis* is said to be common in 18 districts. Of manifestations of *syphilis* paraplegia and aortic valve disease are the only neuritic or vascular forms which are considered to be common. Locomotor ataxy and G.P.I. " are far less common in India than in most European countries."

Tuberculosis of the lungs is very common all over India ; chronic bronchitis with emphysema is common. The information regarding the *dysenteries* is not sufficiently precise to justify analysis. An attempt was made to find out the relation, if any, of *ascites* to dysentery ; the replies favoured the view that there is such a relation. *Scarlatina* was reported from 9 districts out of 212. *Stone* is fairly common throughout India ; it was returned as unknown in 5 districts only. The *cancer* returns cannot be regarded as accurate, but they do indicate some features of interest. Cancer of the breast, uterus and mouth are frequent almost everywhere. Cancer of stomach is less common ; only 8 civil surgeons replied in the affirmative to a question whether they had seen this form at autopsy. Cancer of mouth is commonly attributed to betel chewing. There is tabulated information, province by province, of these forms and of cancer of skin. *Osteomalacia* is fairly common in Bombay, Punjab, United Provinces, and Central Provinces; very rare in Bengal, Madras, Burma and Bihar and Orissa. *Rickets* is more widely spread, but appears to be rare in Bengal, Assam and the Punjab. *Scurvy* is not common except in Bombay and the United Provinces. Of *pellagra* there are 4 doubtful cases from Lyallpur and one well authenticated from Calcutta. *Madura foot* has a wider distribution than was suspected ; there seem to be patches of it in most of the provinces. *Climatic bubo* is reported from a few places, including Cawnpore in the United Provinces. The distribution of *exophthalmic goitre* seems to be a " chance one " ; young adult females are most commonly affected. Acute *anterior polyomyelitis* is not so rare, the authors say, as the records would suggest. Ten surgeons in reply to a direct query report cases of *sprue* in Indians. *Hydatid cyst* is distributed widely but sparsely over India. *Lupus vulgaris* would appear to be uncommon except in the Punjab and United Provinces ;

cases so labelled usually turn out to be something else. ACTON supplies a list of the common *skin diseases* seen at Calcutta in 1926; it is headed by tinea and leprosy.

Readers will agree that "the chief impression conveyed is of the need for a more accurate disease survey of India."

A. G. B.

CALCUTTA. **Fourth All-India Conference of Medical Research Workers held at Calcutta on 13th to 16th December 1926.**—59 pp. 1927. Delhi: Govt. of India Press.

Fifty-four delegates, collectively representing all parts of India, attended the Conference. After preliminaries, the individual members explained for discussion the general nature of their current researches under the programme for 1926–27. This comprehensive scheme of research included in its scope investigations into cinchona alkaloids and other drugs in the treatment of malaria; the larval characters and the breeding-grounds of Anopheles; rat-fleas, Haffkine plague-vaccine; cholera vaccine and other cholera therapy, and the geography of cholera; ankylostomiasis and other helminthological surveys; schistosomiasis in Burma; kala azar and its transmission by Phlebotomus; treatment of leprosy, rat leprosy; beriberi and other deficiency and nutrition diseases; tuberculosis tests and bovine tuberculosis; Indian indigenous drugs; maternal morbidity and mortality in childbirth; dysentery; strains of spirochaetes observed in relapsing fever; skin diseases; bacteriology of intra-ocular inflammations; antirabic vaccine experiments; canine tick fever; action of insulin.

Proposals for the programme of 1927–28 were considered. The proposals are on much the same lines as or in actual continuation of those of the previous year; but also include further malaria surveys and Anopheles investigations and biochemical studies in malaria; study of the bacteriophage of plague (and cholera); lathyrism; sprue; drug-addiction; blood-changes in kala azar; bacteria of human faeces; transmission of relapsing fever. Certain other items were referred to the Scientific Advisory Board or to other Departments.

The Conference also discussed a statement regarding the Central Malaria Organization for India; the question of the co-ordination and promotion of research; and the co-ordination of research of international importance in connexion with the advisory council of the League of Nations Health Committee. The question of the establishment of an Institute of Nutrition Research—a subject towards which the Raja of Parlakimedi had given a lakh of rupees to the Research Fund Association—was among numerous other matters considered.

Among the resolutions following the subjects discussed at the Conference was one expressing the opinion that the Government of India should establish an organization for the standardizing of drugs issued by the Medical Store Department. The Resolution, passed at three previous meetings of the Conference, urging the Government to appoint a Commission to inquire into the wastage of life and the economic loss in India due to preventible disease was reaffirmed.

A. Alcock.

HOOTON (Alfred). **Medical Relief in Rural India. (Being Part of a Report to the Government of Bombay.)**—*Lancet.* 1927. June 4. pp. 1217–1218.

This report is of special interest as coming from the Acting Director-General, Indian Medical Service. He points out that, as holds good for other tropical countries than India, the regular practitioners, fully qualified on modern scientific lines, are too expensive to be multiplied indefinitely for rural work; some less costly agency must be found. Practitioners of the indigenous systems of medicine, the Ayurvedic and the Unani, are in many instances on the spot, but these systems are based on erroneous theories, and the remedies are largely secret: "To restrict treatment to the methods of the indigenous systems in the light of all the advances of the nineteenth century would be unthinkable." The Japanese have completely broken with the old system, imported from China, and have wholeheartedly adopted modern scientific methods. Moreover, he points out, modern medicine had its birth in the East, and should not be regarded with hostility in India.

The creation of a special class, trained in elementary medicine on modern scientific lines, is considered and the employment of permanent Government servants, such as the primary schoolmasters, on a part-time basis. The last alternative is on trial in Bengal. Thirty men are at work in selected villages in districts including Poona and Bijapur:

"Selected primary schoolmasters are posted for a period of training of two and a half months to civil hospitals where special arrangements are made for them. The men are taught elementary anatomy and physiology as in ambulance classes, and given practical first-aid instruction in medicine and surgery. They work in the wards and out-patient department, and the course is made as practical as possible. At the end of it they are expected to be able to dress wounds and ulcers, to treat sore eyes, and to recognize and treat with simple remedies some of the more important diseases. They are also taught elementary hygiene (ventilation, safeguarding of water-supply, prevention of malaria, etc.). Training is, of course, carried out in the appropriate vernaculars. The cost of training works out at about Rs.72 for each man. The equipment (village aid cabinet) costs Rs.250, and the upkeep of one aid-post comes to Rs.300 per annum inclusive. The scheme is therefore very economical.

"It has proved successful, and the Upacharaks, as they are called, are now in great request wherever they are stationed. In Bijapur, particularly, their work has met with cordial recognition from official and non-official observers, and the village officers and villagers in general are almost unanimously in favour of its extension. Requests are frequently received from villages which have no-Upacharaks for aid-posts to be established. A general review of eight months' work, from June 1st, 1925, to January 31st 1926, was taken in the Bijapur district, and the following remarks apply to the ten centres now in operation there. In these ten centres, during the eight months, 31,122 cases were treated. These included malaria, dysentery and diarrhoea, eye diseases, skin diseases, wounds and ulcers, and many other affections. Very favourable reports were received from the collector, the assistant collector, the president of the district local board, and the civil surgeon, amongst others. Equally good accounts have come from Poona, the other district in which the Upacharaks were early established, and it is hoped that a combined report on the whole scheme will shortly be available."

A. G. B.

Schilling (Claus). Arztliche Beobachtungen gelegentlich einer Reise in Süditalien. [**A Physician's Notes on a Journey through S. Italy.**]—*Abhandl. a.d. Gebiet d. Auslandskunde. Hamburg. Univ.* 1927. Vol. 26. (D., Med. & Vet. Vol. 2.) [Festschrift Nocht.] pp. 477–480.

Dr. Schilling contributes an interesting paper, chiefly on malaria in Sicily and the measures taken to combat it. He notes that on the railway where the measures are most complete (quinine and nets) of 4,443 officials in the malarial zone, 14·6 per cent. had acute attacks of malaria, evidence to the author that, like other infectious diseases, malaria can be kept under, but not eliminated. Anopheles were found breeding in the sulphur mines 100 and more metres below the surface. With regard to the suppression of anopheles breeding grounds he remarks that Italy suffers from two evils : want of coal and over-population. Consequently water power must be used, whenever possible, with the result that dammed up lakes harbour anopheles larvae. In the Clinic for Children in Catania more than 10 per cent. of the admissions have kala azar. All suspicious cases are diagnosed, he tells us, by puncture of the epiphysis of the tibia and withdrawal of marrow. Treatment is by tartar emetic introduced into the jugular vein, the child lying on an operation table with head hanging over the edge, under which conditions the vein stands out clearly. From a small village under Vesuvius come 25 per cent. of all the kala azar cases that reach the Naples Clinic ; the transmitting agent is unknown.

A. G. B.

Watson (A. J.). **Notes on Medical Practice in Yunnanfu.**—*China Med. Jl.* 1927. Nov. Vol. 41. No. 11. pp. 922–930.

Sixteen years ago a paper on the diseases of this remote province of China by a French author was summarized in this *Bulletin* (Vol. 5, p. 376). Yunnan, which consists of tableland at over 5,000 feet elevation, is now much less remote, since the capital may be reached by railway from Haiphong in three days. Two factors, the author says, are lowering the general health of the community—endemic goitre, which is widely prevalent, and the opium habit, which affects more than two-thirds of the men and one-third of the women. Opium may be purchased everywhere at a lower price than tobacco. At the author's hospital more than 100 cases of poisoning are admitted yearly. In some notes on treatment it is stated that when life is despaired of an injection of lobeline has a dramatic effect.

Typhus is probably the most fatal disease in the province ; it is not seen at the capital, but is widespread in the villages. Typhoid fever is quite common and paratyphoid A has been identified. Relapsing fever is of frequent occurrence, as a rule not very severe ; it is relieved by 0·3 gm. salvarsan. All three forms of malaria are seen. Leprosy is well established. The out-patient records of the C.M.S. hospital show that nearly 1 per cent. of the 10,000 patients are lepers. Tuberculosis is only second to typhus ; the commonest form is pulmonary, but tuberculous peritonitis and tuberculous disease of bones and joints are frequent in children. Acute rheumatism and mitral disease are not uncommon. Epidemic encephalitis is endemic and one of the patients dates his illness back to a period antecedent

to the description of this disease in Europe. In 1927 12 cases of post-encephalitic parkinsonism were seen. Many other diseases receive mention. No case of plague has been seen for many years.

A. G. B.

LECOMTE. L'assistance médicale en Cochinchine pendant l'année. 1925. (Extraits.) [**Medical Relief in Cochin China in 1925. Extracts from Report.**]—*Ann. de Méd. et de Pharm. Colon.* 1927. Apr.–May–June. Vol. 25. No. 2. pp. 167–224.

From this long report dealing largely in matters of local interest some information of more general value can be extracted. [Cochin China has about 4,000,000 inhabitants.]

Principal endemic diseases.—Of surgical diseases *appendicitis*, considered to be very rare in Asiatic races, was seen in 89 natives. Of *stone in the bladder*, of such a character that hospital admission was necessary, there were 94 cases. *Malignant tumours* furnished 539 admissions with 103 operations. At the native hospital there were 29 operations for tumours of the face and tongue, 11 for breast cancer, 9 for malignant tumours of the neck, 7 hysterectomies and 7 operations for cancer of the penis. The hospital now has 542 milligrammes of radium for the treatment of malignant tumours.

Of general diseases *malaria* is most prevalent ; 14 cases of *blackwater* fever were seen. Malaria is becoming less prevalent with the advance of civilization. State quinine was distributed in this year to the amount of 249 kilos, of which 73 were sold. It is not practicable to supply quinine for the whole population and its use is mainly restricted to troops, schools, prisoners and the like. *Intestinal parasitism* is widespread, above all ankylostomiasis. *Beriberi* accounted for 1,603 admissions with 290 deaths, as against 190 deaths the year before ; it is specially frequent on plantations. Three cases of *scarlet fever* were seen. In 1925, it is stated, nearly 11 million litres (2,877,000 gallons) of "pure alcohol" [alcool pur] were consumed (industrial uses included) ; *alcoholism* is serious in the towns. Of diseases of the eyes *conjunctival affections* come first and *trachoma* second ; the former are the chief cause of blindness.

A large number of women are admitted to hospital for confinement, 15,821 in this year, 120 per mille of the total number, with 102 deaths or 0·6 per cent. Infant consultations are multiplying. Umbilical tetanus, formerly one of the chief causes of infantile mortality (3·3 per cent. in 1905), has fallen largely (0·37 in 1925). At Saigon the infant mortality of the first month fell in these respective years from 23·8 to 5·8 per cent., and that of the first year from 33·8 to 12·9 per cent.

In the course of the year 7,274 cases of transmissible disease were reported, including 6,165 cases of *dysentery*, 658 *smallpox*, 65 *cholera* and 23 *plague*. These are the four principal diseases. It is stated that amoebic dysentery is more prevalent than bacillary, but hepatic complications are rare ; bacillary dysentery is common in children. Plague is steadily diminishing, partly, it is thought, owing to the preventive measures which are accepted more and more willingly by the natives ; 5,384 vaccinations have been done. Cholera has remained stationary in incidence. Its prevention is much more difficult than that of plague. There is always risk of an epidemic in the spring, at the close of the dry season, when the cisterns are empty and recourse for drinking is had to stagnant pools ; 10,589 vaccinations were

practised. No case of cholera has been reported in persons regularly vaccinated. The incidence of smallpox gets steadily less ; there were nearly a million vaccinations in the year, of which some 375,000 were primary. *Enteric fever* makes little progress ; there were 56 deaths from this cause.

The author writes that *syphilis* is certainly less grave than in Europeans ; it attacks the bones and skin rather than the more important organs ; tabes and G.P. are very rare. The chief danger is the effect on the birth-rate. There is about to be built at Saigon an Institute of Syphiligraphy where the most recent methods of diagnosis and treatment will be practised. Of all the affections which menace the population of Cochin China the most to be feared after malaria is *tuberculosis*. According to researches of the Saigon Pasteur Institute 55 per cent. of the population give positive cuti-reactions. The Municipality of Cholon has set in train a social enquiry, starting with school children and extending to their homes, families and surroundings. At the end of December 5,019 babies had been vaccinated with Calmette's B.C.G. made at the local Pasteur Institute. The vaccines are usually given on the 3rd, 5th and 7th days after birth. It is desirable to reduce this period, since many native mothers will not remain in hospital so long.

A. G. B.

i. Nederlandsch Tijdschrift voor Geneeskunde. 1927. July 16. 71st Year. 2nd Half. No. 3. pp. 335–349. [6 refs.]—Nederlandsche Vereeniging voor Tropische Geneeskunde. Vergadering op Zondag 20 Maart, 1927. [**Transactions of the Netherlands Association of Tropical Medicine, March 20, 1927.**] [Beijnen (G. J. W. K.), Reporter.]

ii. Ibid. July 30. No. 5. pp. 568–582.—Nederlandsche Vereeniging voor Tropische Geneeskunde. Vergadering op Zondag 29 Mei 1927. [**Transactions of the Netherlands Association of Tropical Medicine, May 29, 1927.**] [Beijnen (G. J. W. K.), Reporter.]

i. Three papers were read at this meeting. Eijkman reported on the results of experiments with the pure vitamin B of Jansen and Donath (see this *Bulletin*, Vol. 24, p. 126 and 607), of which substance he received a small quantity from the authors. Whilst Jansen and Donath confined their experiments to tests by which the preventive action of the vitamin was clearly demonstrated, Eijkman also proved its curative action, experimenting with pigeons and cocks. Non-specific curative action upon polyneuritis avium is possible by various substances containing no vitamins, but is only temporary. The effect of the pure vitamin proved to be lasting. The addition of 2 mgm. of the stuff to one kilo polished rice was not quite sufficient to protect the animals against polyneuritis, but 4 mgm. absolutely fulfilled this purpose. No reasonable doubt is justified as to the chemical purity of the product.

Elders, whose views on sprue as a deficiency disease have been referred to previously (see this *Bulletin*, Vol. 21, p. 705, and Vol. 24, p. 382), was induced by the likeness of sprue and pernicious anaemia to treat the latter disease along the same lines as sprue. Minot and Murphy also treated pernicious anaemia with a dietary of which they consider liver to be the active principle ; their results are very favourable and in Elders' opinion constitute a support for his theory. He quotes

several cases of pernicious anaemia treated with more or less success with his diet of which raw meat, raw milk and plenty of vitamins are the principal parts.

VAN THIEL read a paper dealing with the morphological differential diagnosis between the strongyloid larvae of Necator, *Ancylostoma duodenale* and *Uncinaria stenocephala* (a dog hookworm). This cannot be summarized concisely.

ii. HOOLBOOM gave a description of dhobie itch, " kutu aer " and similar affections of the skin. He quotes cases and discusses etiology and epidemiology. Dhobie itch may be identified with eczema marginatum, for which affection, however, neither in Europe nor abroad can a special fungus be held responsible. " Kutu aer " is a bullous eczema between the toes common in the D.E.I. in workers in swampy places ; it is known under other names in other tropical countries. The mycotic etiology of the affection is well established, but is not uniform. The epidemiology of these diseases is rather obscure. The fungi may be more or less ubiquitous and only become pathogenic on the softened, perspiring skin. This, of course, does not exclude an occasional passage from man to man.

SNIJDERS considers the paratyphoid A problem and reaches the conclusion that paratyphoid A can get no hold in N.W. Europe, not from immunity of the individuals, but of the community ; the tracks along which the disease used to spread are blocked by modern sanitation. Paratyphoid A requires a stronger degree of " faecal community " than does typhoid fever, because the number of patients becoming carriers is relatively smaller and the time during which the bacillus is excreted after clinical recovery is shorter than in typhoid infection.

COENAES read a paper on the use of buffer-solutions in the staining of blood slides after Giemsa. The haematoxylin test of the reaction of the distilled water used for diluting the dye is not a perfectly trustworthy one and the author recommends the use of buffer solutions pH7, which may be kept longer without alteration than distilled water neutralized with soda. For details the original paper must be seen.

W. J. Bais.

BERNARD (R.). La Pastoria de Kindia (Guinée). [**The Pastoria of Kindia, French Guinea.**]—*Bruxelles-Méd.* 1927. Oct. 16. Vol. 7. No. 51. pp. mcdlxxxv-mcdxci. With 2 text figs. [3 refs.]

An interesting account of the great monkey park to which the name of Pastoria has been given. Kindia, which has a station on the railway line between Konakry and the Niger, is 160 kilos from the coast and a great centre for the cultivation of bananas. The institute is in the middle of a concession of 39 hectares, 16 of which are under cultivation. Besides bananas pineapples are grown, which, with rice, milk, biscuits, roast fowls, tea and eggs, form the diet of the chimpanzees; the other monkeys prefer manioc. A herd of cattle serves for the production of rinderpest serum, the control of biological products, the traction of vehicles, and the production of manure ; the milk is used partly for the chimpanzees and sick monkeys. The native method of hunting the chimpanzee is described ; it leads to the death and injury of many, but has been pursued with energy because of the high price to be obtained in the European market. The export of chimpanzees except for scientific purposes is now forbidden. Better methods of capture are now under consideration, such as a bait of food soaked in alcohol,

of which they are fond—when " dead drunk " they are easily secured ; the use of arrows poisoned with snake-venom—when they fall envenomed from the trees they are to be resuscitated with antivenin! Once captured and brought to Pastoria it is found that they are extremely susceptible, even when kept in the open, to the microbes of man, and die in considerable numbers from intestinal affections.

The first experiment made with the monkeys was vaccination for tuberculosis with B.C.G. an account of which was published in this *Bulletin* [Vol. 23, p. 323]. Other researches are in progress, and foreign savants are welcomed at the laboratory.

A. G. B.

Licheri (A.). Notes de pathologie tropicale. [**Notes of Tropical Pathology.**]—*Ann. Soc. Belge de Méd. Trop.* 1927. Nov. Vol. 7. No. 2. pp. 151–156.

These notes concern malaria and the cuti-reaction for tuberculosis in the native military force at Irebu on the Congo, women and children included. Of 1,100 examined for splenic index in November [details not given] 95 or 8·6 per cent. were positive, and of those 95, 32 showed parasites in the blood (24 subtertian, 8 quartan).

The cuti-reaction was tested in 1,028 instances : 221 or 21·4 per cent. reacted positively. Of 77 children at ages from 2 to 5 years only one was positive. Three tables are given. Two concern the reaction among the black personnel of Europeans, and among men at the end of their term of service. The numbers are too small to give reliable percentages.

A. G. B.

Clevers (Marguerite). Hygiène scolaire à Stanleyville en 1925–1926. [**School Hygiene at Stanleyville, 1925-6.**]—*Ann. Soc. Belge de Méd. Trop.* 1927. Nov. Vol. 7. No. 2. pp. 165–169. [Bact. Lab., Stanleyville, Belgian Congo.]

The schools at Stanleyville at this period contained 645 children, 470 boys and 175 girls. The limits of age appear to be 6–14 years. 70·1 per cent. had malarial parasites in their blood, made up of subtertian 62·7, quartan 7, and tertian 0·3 per cent. Two groups, of 76 and 47 pupils, received quinine over a period of 5 weeks, from half to one gram per day. The results were not very clear, and the trials were abandoned.

Of the pupils 38·9 per cent. were infested with intestinal worms, chiefly ankylostomes (24 per cent.) and ascaris (11 per cent.) ; carbon tetrachloride in 3 cc. doses repeated monthly gave excellent results in ankylostomiasis.

An examination for the cuti-reaction (tuberculosis) gave 41·4 per cent. of positives.

A. G. B.

Gravellat. Le recrutement des troupes indigènes en Afrique occidentale française. [**Recruitment of Native Troops in French West Africa.**]—*Ann. de Méd. et de Pharm. Colon.* 1927. Apr.–May–June. Vol. 25. No. 2. pp. 225–248.

Of 147,000 men eligible for recruitment in 1926, a contingent of 11,000 had to be raised. Details are given of the results of the examinations and the medical reasons for rejection in each of the seven

colonies with data of tribes. These are of local interest. In the general conclusions one observation merits notice. All the medical personnel employed in recruiting agreed that the age of 19 years, fixed by decree of July 1919, is too low and that this accounts for the large number of postponements. At this age the African native has not completed his growth, a failure which the author attributes to the hygienic conditions and poor dietary. Complete development is attained at 22 years and this should be the minimum age for recruitment. The chief causes of rejection were poor development, umbilical hernia, eye affections (chiefly trachoma), venereal diseases, ulcers and faulty cicatrices, cardiac disease (especially in Dahomey), arthritis, dracontiasis and yaws (Ivory Coast), malaria, leprosy, and alcoholism in the coastal regions.

A. G. B.

Philip (C. R.). **A Report on a Preliminary Investigation into Morbidity among the Wateita.**—*Kenya and East African Med. Jl.* 1927. Nov. Vol. 4. No. 8. pp. 250–255.

The observations here recorded were made during a fortnight's tour among the 30 to 40 thousand people composing this tribe. In over 600 examined the diseases found prevalent were helminthiasis, yaws, malaria and tuberculosis. Helminthiasis, the author thinks, is responsible for much of the ill-health, round worms and ankylostomes being the chief parasites. The anaemia and " flabby heart " is attributable to the ankylostomiasis and possibly also to ascariasis. In cases suspected of worms it was constantly found that vocal fremitus and vocal resonance were decidedly increased over the lung apex on the right side : this is considered to be a " pulmonary reflex " caused by the passage of immature round worms and ankylostomes through the lungs and to be the probable cause also of the common bronchial catarrh. Groups of 46, 35 and 127 school children between 4 and 15 years were examined. Helminthic infection varied between 52 and 91·4 per cent. In over 400 adults the general nourishment was almost invariably under normal. Anaemia and cardiac murmurs were noted in 64 per cent. ; 61 per cent. were considered to have some worm infestation. Of the stools microscoped 50 per cent. contained ascaris, 31 ankylostomes and 12·5 trichuris. Yaws occurred in 39 per cent. Of the 4 groups studied " definite T.B." was found in from 3·25 (adults) to 14 per cent. The school children suffered from dental caries, gingivitis or pyorrhoea in 14 to 41 per cent. of cases and from enlarged tonsils in 12·6 to 23 per cent. of cases. Conjunctivitis and granular lids were frequent among them. Many babies were marasmic because the mother was unable to suckle and no other milk was available.

A. G. B.

Prum (T.) & Vigoni (M.). Le travail du médecin itinérant au Congo. [**The Work of the Itinerant Doctor in the Congo.**]—*Bruxelles-Méd.* 1927. Apr. 24. Vol. 7. No. 26. pp. dcxcxiii-dccxxvi, dccxxix.

The authors' job is to travel in a radius of 30–60 kilos round Leverville to inspect the camps of the Societé Anonyme des Huileries du Congo Belge, to look out for sleeping sickness and to give medical assistance to the natives of the concession. For this purpose the Company provides a doctor, a European sanitary inspector (agent

sanitaire), 6 native hospital assistants trained at Kinshasa laboratory, and subordinate personnel. Most of the posts are linked by a steamboat service, but the doctor's journeys are made over land. Besides drugs and instruments he carries three microscopes, an autoclave and a typewriter. The village to be inspected is reached in the afternoon so that work may be begun about 6 a.m., before the people have dispersed on their daily tasks. All the population presents itself as a rule. A count is made of the men, women and children, they are vaccinated against smallpox and their glands palpated. Statistics are given for the months of April, June and July (diseases with records of less than 10 omitted).

	April.	June.	July.
Number of persons examined and vaccinated	5,463	2,744	5,010
Number of persons treated	666	303	379
Number of consultations	680	311	396
Sleeping sickness	19	10	2
Malaria	12	4	5
Yaws	267	117	53
Filariasis	40	1	1
Diseases of the eyes	6	0	11
Diseases of the ears	20	0	2
Headache from unknown cause	16	0	0
Respiratory diseases (other than pneumonia)	32	8	13
Diseases of the mouth, teeth and throat ...	15	0	1
Ankylostomiasis	23	8	4
Other helminthiases	21	6	2
Ulcers of the legs	38	11	19
Other skin diseases	56	99	54
Inflammations, boils, abscesses	12	1	9
Injuries	14	5	22
Negative gland puncture for trypanosomiasis	103	45	145
Splenomegaly (blood not examined) ...	18	0	0

It is noted that trypanosomiasis is becoming rarer owing to the treatment employed. It is considered that the headaches and splenomegalies were malarial in origin. Four cases of acute articular rheumatism are noted but without details. Syphilis does not figure in the list, and it is stated that tuberculosis is extremely rare.

A. G. B.

Maass (Edgar). Zur Pathologie des Liberianischen Hinterlandes. [**Pathology of the Liberian Hinterland.**]—*Abhandl. a.d. Gebiet d. Auslandskunde. Hamburg. Univ.* 1927. Vol. 26. (D., Med. & Vet. Vol. 2.) [Festschrift Nocht.] pp. 268–273. [Missions-Hosp., Bolahun, Liberia.]

The mission station from which the author writes is at 700 metres elevation three days march from the terminus of the Sierra Leone railway, and was founded in February, 1926. Some details of the character of the country and of the tribes are given. Many cosmopolitan diseases are mentioned. Of these pneumonia does not take the important place that it does on the coast and tuberculosis is rare; the latter is chifly found among the Mandingos, who are the petty traders.

Malaria is by far the most important disease. The infantile mortality of 500 per mille is, in the author's opinion, almost exclusively due to it. Among 230 children suffering from yaws the splenic index was 71 per cent. Yaws takes the second place. Over 80 per cent. of the admissions were infected. Papillomatous and tertiary forms were about equally prevalent. Rhinopharyngitis mutilans was seen in 15 out of 1,440 cases and twice was associated with goundou. Juxta-articular nodules are frequent. For the treatment of yaws bismogenol was employed with very good results. Leprosy occurs in both forms, especially the nervous ; lepers form probably 1 per mille of the population. Of 276 persons examined for intestinal parasites only 8 were free. Ankylostomes were found in 265, ascaris and trichuris in 134 and 117. Figures are given of multiple infestations. Hookworm disease, however, was rare ; severe anaemia which could be attributed to hookworms was seen only 3 times.

Schistosoma haematobium is widespread. Of 87 hospital patients, all but 3 admitted for other reasons, 33 were found infested. A large proportion of diseases of women, gonorrhoea apart, is due to schistosomiasis. *S. mansoni* has not been found. Blood filariae are rare, but onchocerca nodules are common and the corresponding microfilariae still more so in excised skin. Nodules on the forehead or temples are fairly frequent. No association with eye disease came to light. No case of human trypanosomiasis was seen. The conclusion is that malaria, yaws, hookworm and schistosomiasis are the most important diseases which call for preventive measures. A campaign against yaws is in preparation. The author refers more than once to Blacklock's publications from Sierra Leone, of which he gives a list.

A. G. B.

Beyers (C. F.). **Incidence of Surgical Diseases among the Bantu Races of South Africa.**—*Jl. Med. Assoc. S. Africa.* 1927. Dec. 10. Vol. 1. No. 23. pp. 606–612.

The data given in this paper concern 18,000 Bantu in-patients, men, women and children, admitted to the Johannesburg hospital during a period of six years ; they are mainly labourers and domestic servants. A table of the surgical conditions found is given, followed by a discussion of the more interesting points.

Surgical *tuberculosis* is, the author thinks, more common among the Bantu than among the European inhabitants of S. Africa ; 20 per cent. of the tuberculosis of the Rand is estimated to be surgical, chiefly affecting the lymphatic glands of the neck. Bone and joint tuberculosis is very common, affecting in the order given spine, hip, knee and tarsus. Abdominal tuberculosis is more common than in Europeans ; tuberculous epidydimitis is common. No case of *lupus* has been recorded.

Syphilis. Twice as many native in-patients give a positive Wassermann as European in-patients, though the Europeans are three times as numerous. The author estimates that one native in three is infected. Surgical syphilis is uncommon. Gonorrhoea is very prevalent, but the common complications do not occur as frequently as in Europeans [no information about stricture]. The author's experience is that the Bantu has a greater natural resistance to *sepsis* than the European. *Ulcers* of the leg are very common and are most frequently

syphilitic. Varicose ulcers are exceedingly rare. *Gall-stones* and *peptic ulcer* are "conspicuous by their rarity;" one case of gastric and three of duodenal ulcer occurred in the period, and one case of gall-stones. The commonest *liver conditions*, excluding carcinoma, were *amoebic abscess* and *hydatid*. *Intestinal obstruction* was common (44 operations); constipation is not infrequent and in 147 cases led to a provisional diagnosis of intestinal obstruction. *Inguinal hernia* is common, but *umbilical hernia* is rare—6 cases. *Dental caries* and *pyorrhoea* are extremely common. *Haemorrhoids* are rare—5 cases. *Appendicitis* is rare. Over 500 Europeans are operated on yearly at Johannesburg, but in this series of natives there were only 80, 50 of which were verified by operation. The average age is higher than among Europeans. The author discusses this subject at some length. *Calculi* are very rare among the Bantu—one vesical and 4 urethral—though *schistosomiasis* is common. *Enlarged prostate* is rare—6 cases. *Variocele*—no cases. *Gynaecological conditions* are as common as in Europeans. There were 8 cystic adenomas of the *thyroid*, but no case of Graves's disease. *Brain tumours* are rare; hydrocephalus and meningocele fairly common. Natives recover well from severe fractured skull. Bad compound *dislocations* do extraordinarily well, function being well restored.

Osteomyelitis is common and tends to become chronic. There has been no case of *internal derangement of the knee*. A sub-acute condition of the knee-joint is fairly common, resembling a rheumatic arthritis with periarticular structures swollen and effusion into the joint. In 12 cases examined the author has never found a focus of infection. With a back splint and a course of salicylate recovery is rapid. Of *genu valgum*, possibly related to rickets, there were 4 cases. *Congenital club foot* is fairly common. *Flat foot* is a rare disease—3 cases. "Dr. Fouché, of Johannesburg, informs me that the appearance of flatness is due to the great development of the abductor hallucis." *Prepatellar bursitis* is quite common. Fourteen cases of *ainhum* were seen, all in males. *Varicose veins* are rare; of 8 cases 3 were in multiparae.

The author does not think that, apart from industrial, tuberculous and venereal disease, the introduction of European clothing, diet, and micro-organisms has made any serious difference to the native's health. Certain diseases such as peptic ulcer, gall-bladder conditions, appendicitis, cancer, appear to be just as rare among the civilized as among the raw natives. The information about tumours will be given in the *Bulletin of Hygiene*; of malignant disease there were 106 cases. [Schistosomiasis being common, it is curious that surgical complications which are so frequent in Egypt are not recorded in South Africa.]

A. G. B.

KENNY (Della M.). **Notes on the Training of Native Hospital Orderlies.** —*Kenya & East African Med. Jl.* 1927. May. Vol. 4. No. 2. pp. 62–64.

This short paper by the Nursing Sister in charge, Native Hospital, Nairobi, will encourage those who have to undertake a similar task, for after narrating some of the difficulties and disappointments she concludes that "with training and supervision the African who is keen on his work can be made into an excellent nursing orderly."

A. G. B.

Mühlens (P.). Beobachtungen ueber die Pathologie von Venezuela und Mittelamerika. [**Observations on the Pathology of Venezuela and Central America.**] *Abhandl. a.d. Gebiet d. Auslandskunde. Hamburg. Univ.* 1927. Vol. 26. (D., Med. & Vet. Vol. 2.) [Festschrift Nocht.] pp. 361–379. With 14 figs. on 3 plates. [5 refs.] [Inst. for Ship & Trop. Diseases, Hamburg.]

The author reached Venezuela in December 1926, travelled via Colombia and Panama through Central America and left Vera Cruz in Mexico at the end of April, 1927. In the intervals of lecturing he was able to make some observations which he here recounts.

Venezuela.—Malaria is very prevalent. Taking parasitic and splenic indices together they reach in the worst districts 65-100 per cent. Tables show that of 410 persons examined, including many children, from six localities, 46 per cent. were infected, 85 infections being subtertian, 46 tertian, 46 quartan, and 13 tertian + quartan; and that of 546, mostly children, 50·9 per cent. had enlarged spleens, the total combined indices, i.e., parasitic and splenic without parasites, being 59 per cent. A third table, in which the spleens are classed according to projection into the abdomen, in 7 classes, shows that projections of a hands-breadth and more were quite common. In one place all of 64 examined had the spleen enlarged. The author comments on the proportion and the size of the enlarged spleens, which were such as he had not previously encountered. Kala azar, he says, does not come in question. In by far the greater number of subtertian infections crescents were present.

Some account is given of other diseases prevalent in Venezuela. Leg ulcers were excessively common, but little could be ascertained as to their nature. He was struck by a peculiar disease of the foot which he figures; it resembles Madura foot but is different. It is not a manifestation of yaws, for no yaws was seen. There and in Central America cases of "mossy foot" came under observation. These are described and figured. Two pieces of tumour were excised and the reports on them by Rocha Lima are given; in neither case were parasites or mycelium discovered. Night blood examination of 74 dock labourers at Puerto Cabello showed 14 to harbour Microfilaria bancrofti, but none showed symptoms of filarial infection. Of 19 Germans examined at the same port all were free.

Passing over Costa Rica, Salvador and Guatemala, where few observations were made, we come to *Mexico*, where the author was able to make an expedition into the interior. He notes that the sanitary state of Tampico has greatly improved of recent years. The malarial mortality, formerly 95 per 10,000, has progressively decreased and in 1925 was 14, while the total mortality has come down from 49 per mille in 1921 to 27·9 in 1926; it is calculated that 5,224 lives have been saved in those five years. Children were examined in two schools on the outskirts of Tampico; of 170 only 7 had enlarged spleens, in 6 instances slight; it is noted that this was not the malarial season. No malaria cases were found in either of two Tampico hospitals. He found anopheles breeding in small numbers and especially among the leaves of the floating islands of water lilies in the large lagoons and floating collections of water plants, such as Ceratophyllum, Cabomba and Potamogeton known as "Granillas." These water lilies play a great part as breeding places and are extremely difficult to deal with. In Vera Cruz also malaria has much diminished. Many examinations

for malaria were made and recorded for small groups in various parts of Mexico. Of other diseases pinta or carate was frequent. There are 14 photographs of characteristic disease conditions.

A. G. B.

Pino Pou (R.). Notas para la geografía médica de Venezuela. Enfermedad de Chagas en Barinitas. [**The Medical Geography of Venezuela. Chagas's Disease in Barinitas.**]—*Gac. Med. de Caracas.* 1927. Mar. 15. Vol. 34. No. 5. pp. 65–66. With 1 text fig.

Malaria and hookworm infection exist in Barinitas as causes of anaemia and debility, but cases with these symptoms were met with which could not be thus explained. Many of the children exhibited marks of insect-bites and the author collected specimens of *Rhodnius prolixus* and had them examined. They were reported to contain evolution forms of *Trypanosoma cruzi*. Further examination of the children showed that myxoedema was fairly frequent also and it is concluded that Chagas's disease is widespread in the district.

Other diseases are casually mentioned, carate, tuberculosis and syphilis. There are a large number of biting-flies—mosquitoes, tabanids, phlebotomus, and others.

H. Harold Scott.

Hees (Hermann). Epidemiologie und Praxis im Camp. Studienberichte aus Guatemala. [**Epidemiology and Camp Practice in Guatemala.** —*Abhandl. a.d. Gebiet d. Auslandskunde. Hamburg. Univ.* 1927. Vol. 26. (D., Med. & Vet. Vol. 2.) [Festschrift Nocht.] pp. 173–176. [Guatemala Plantations Ltd.]

The author, who appears to be in the employ of Guatemala Plantations Ltd., states that dysentery and malaria were so severe on these coastal plantations in the first rains that he was commissioned to study and report upon the camps. The diseases he discusses chiefly are amoebic dysentery, malaria and helminthic infections. No evidence is given that the dysentery is amoebic. He associates it with the water supply and plagues of flies and says that the labourers preferred yatren to emetine. Ninety per cent. are said to be infected with ankylostomes. Other diseases are touched on, and it is stressed that whoever would improve the sanitation must first carefully study the habits and customs of the country.

A. G. B.

Menk (W.). Infektionskrankheiten im Küstentiefland des Departamento Magdalena von Columbia S.A. [**Infectious Diseases in the Coast Lands of Magdalena, Colombia.**]—*Abhandl. a.d. Gebiet d. Auslandskunde. Hamburg. Univ.* 1927. Vol. 26. (D., Med. & Vet. Vol. 2.) [Festschrift Nocht.] pp. 333–344. [1 ref.]

This paper concerns Santa Marta, the chief port of Magdalena, and the country behind it where are the bananeries of the United Fruit Company. It is noted that the rainfall is low and the dry season prolonged, so that the plantations are watered by irrigation, and that the races are so mixed that it is not possible to reach conclusions on racial pathology. The best survey of the prevailing diseases of this region is to be obtained by studying the reports of the United Fruit Company which treats annually about 18,000 persons, but it is

noted that these consist for the most part of adult males. The table gives useful information. The low mortality for lung tuberculosis is due to the fact that such patients become incapable of work and are discharged from the Company's service.

Disease.	Percentage of all hospital cases.	Percentage of case mortality.	Percentage of all cases of death.
1. Malaria	18·6	0·9	4·3
2. Amoebic dysentery	8·0	1·1	2·2
3. Other causes (injuries, etc.)	7·7	3·6	6·6
4. Ankylostomiasis ...	6·3	0·	0·
5. Pneumonia	5·4	31·8	44·2
6. Influenza	5·2	0·	0·
7. Venereal Diseases	4·1	0·6	0·6
8. Ulcerations—Leg Ulcers ...	3·5	0·	0·
9. Cellulitis and acute abscesses	3·4	0·6	0·6
10. Lymphatic diseases ...	2·5	0·	0·
11. Hernia	1·7	1·2	0·6
12. Lung Tuberculosis ...	1·2	10·4	3·3
13. Typhoid and Paratyphoid ...	1·1	13·5	3·8

Diseases which do not find a place in this table are polyneuritis (of beriberi type), splenomegaly with anaemia, liver abscess, hepatitis and catarrhal jaundice, all of which are frequent.

Malaria is not so prevalent here as in other parts of the tropics, owing to the low precipitation ; in 1923 20 per cent. of hospital patients had it ; in 1924 (a wet year) 34 per cent., but if the possessors of large spleens are added the percentage becomes about 61. The blood examinations showed 58 per cent. subtertian, 37 per cent. tertian and 2·7 per cent. quartan [in these figures no children are included]. Blackwater fever is rare, one to three cases are seen yearly.

The author compares the small proportion of entries for amoebiasis with the figure of 53·7 per cent. obtained by KOFOID for *E. histolytica* found in the stools in the same year at Santa Marta [see this *Bulletin*, Vol. 24, p. 2] ; in the majority of cases symptoms are absent. He has seen neither lung nor arthritic complications.

The pneumonia which causes such a large percentage of deaths is mostly pneumococcal. All four types occur. Pneumococcus septicaemia is the cause of many rapidly fatal cases without marked symptoms. Typhoid and paratyphoid come next to pneumonia. From the combined results of blood culture and the Widal reaction in 1925, of 51 cases 78 per cent. were typhoid, 12 paratyphoid B and 8 per cent. paratyphoid A. A systematic stool examination revealed enteric bacilli in 18 per cent. of all patients admitted. Bacillary dysentery is of fairly frequent occurrence, but much less so than amoebic. *B. dysenteriae*, Groups II and III, were identified but not Shiga-Kruse. Venereal diseases accounted for 4·1 per cent. of admissions, of which about half were for syphilis. A series of 1,000 cases in which the Wassermann reaction was tested showed 23 per cent. strongly positive and 3 per cent. positive. Of males over 45 [number not given] 35 per cent. were strongly positive. The author suggests that these high figures may be accounted for by attacks of yaws in childhood.

The chief groups of skin diseases were leg ulcers (53 cases, with 23 per cent. W.R.+) and the group caused by fungi, chief of which is pinta or carate; 10 per cent. of patients from inner stations suffer from this complaint. The author states that of 67 patients with well-marked carate no less than 70 per cent. gave strong positive Wassermanns.

The percentages of the commoner intestinal worms were high, but symptoms due to hookworm (75 per cent. harbourers) were rare. Albumin and casts were found in the urine of 25 per cent. of 483 hospital patients; acute nephritis and definite nephroses are, however, rare. In about 5 per cent. of all ward cases neuritis, polyneuritis and disturbance of tendon reflexes are observed; all stages up to definite beriberi are seen; wet beriberi is, however, rare.

Splenomegaly with anaemia and liver cirrhosis was seen in 2½ per cent. of ward cases; this is usually regarded as malarial, but the author thinks that it calls for investigation.

Diseases noted as absent from this region are—relapsing fever, yellow fever, cholera, typhus, schistosomiasis, *Filaria bancrofti* infection and scarlet fever.

A. G. B.

JANTZEN (Walter). **Post-Mortem Summary.**—*Fifteenth Ann. Rep. Med. Dept. United Fruit Company, Boston, Mass.* 1926. pp. 186–189.

During the year 1926 72 autopsies were performed in the Truxillo Railroad Company Hospital, Puerto Castilla, Honduras; 57 were Latin-Americans, 11 negroes and 2 each East Indians and Caucasians, all under 35 years. There were 23 cases of lobar pneumonia, which was responsible for more deaths than any other disease; pneumococci were always found in the diseased tissues. Lesions of the central nervous system were found in 5 cases (3 pneumococcic meningitis). Kidney diseases were present in 6 instances, 3 the interstitial type of chronic nephritis; systematic microscopic examination would have revealed more renal disease. Three deaths were from malaria, and four from blackwater. Eight bodies showed syphilitic changes. Carcinoma was found twice, sarcoma once. Cirrhosis of liver was found thrice. Twelve patients died of external violence. The author comments :—

"Only 7 out of 72 of the deaths autopsied were due directly to malaria or diseases related to it (principally blackwater fever). There is undoubtedly, however, a lowered resistance caused by repeated attacks of malaria as well as by intestinal parasites, which no doubt unfavourably influence the course of pneumonia and other diseases that come to autopsy. Uncinaria infection is present to some degree in practically all patients, although it was not the cause of death in any case autopsied.

"The enlarged spleen so commonly found at autopsy, often of enormous size, is probably caused by repeated attacks of malaria. In a great number of these cases, malarial pigment is found in the spleen and the bone marrow. These changes were found principally in Latin-Americans, in contrast to the negro race, which seems more resistant to malaria."

"Tuberculosis, although a common disease here, has received little discussion, inasmuch as patients are encouraged to go to a more suitable climate as soon as this condition is diagnosed."

A. G. B.

GAGE (Alfred). **The Machete versus the Microbe in Central America.**—*Fifteenth Ann. Rep. Med. Dept. United Fruit Company, Boston, Mass.* 1926. pp. 205–212.

In this paper, from Quirigua Hospital, Guatemala, the author comments on the low resistance of the peons or mozos to acute infections and contagious diseases, particularly pneumonia, and, on the other hand, their remarkable resistance to terrific wounds from firearms and cutting and piercing instruments. In many cases of pneumonia the mozo died when an Anglo-Saxon would probably have survived, while in many instances the native bore with impunity wounds such as a person of the other race would have succumbed to rapidly. The mozos take measles badly, but the mortality is low. In influenza the incidence of pneumonia is higher than in U.S.A. A table shows that in 1925 20·8 per cent. of all hospital deaths were caused by lobar pneumonia, and 6·5 per cent. by broncho-pneumonia, and that the fatality rate was 33·9 per cent. The author notes in explanation of the rate of fatality that many patients are admitted in an advanced stage of disease having been strongly purged, that most are poorly nourished and suffer from malaria and intestinal parasites, and that they have a poor myocardium and often valvular murmurs due to anaemia.

A description is given of the wounds to which the mozos are liable, mostly from the machete, a razor-sharp knife, two or three feet long; many entail the loss of brain substance. Their resistance is high except to wounds in and about the knee joint, where the percentage of purulent arthritis is very high. Two factors which, in the author's opinion, give a partial explanation of the resistance to these extensive lesions of the tissues are—the low degree of shock present and the fact that they are usually drunk when the wounds are inflicted.

A. G. B.

SHATTUCK (George C.). **The Present Status of Tropical Medicine in the United States. Presidential Address.**—*Amer. Jl. Trop. Med.* 1928. Jan. Vol. 8. No. 1. pp. 3–8.

Though it would seem hardly necessary in this *Bulletin* to quote passages supporting the necessity for the study of tropical disease, this view is not held in all quarters, and it may be useful to give Dr. Shattuck's opinion. He says :—

"There are those who seem to feel, either because no large group of diseases is confined exclusively to the tropics or because the usual laboratory methods can often be used for investigations of tropical diseases, that instruction in tropical medicine, as such, is superfluous. It seems to me that this view is unsound in that it ignores practical needs and essential facts."

"The practice of tropical medicine is an outgrowth and an extension of the general medicine of the temperate zone but it demands a superstructure of special knowledge and experience not easily acquired. Moreover, the application of preventive medicine in the tropics requires special knowledge of tropical disease and of conditions of life in the tropics, and requires, at times, special methods for applying hygienic principles."

The whole address is a plea for adequate special training for those doctors who are to work in the tropics.

A. G. B.

Lavinder (C. H.). **Comment on Tropical Diseases of Interest in New York City—a Brief Review.**—*Bull. New York Acad. Med.* 1927. Sept.–Oct. 2nd Ser. Vol. 3. Nos. 9, 10. pp. 563–575.

This, a description of diseases of warm climates which might be seen in New York, has no special interest for us. The diseases discussed are the quarantinable infections—cholera, yellow fever, smallpox, typhus, leprosy and plague; malaria, especially the potentially dangerous subtertian form; amoebiasis and liver abscess; beriberi, pellagra and sprue; tularemia and undulant fever; Weil's disease and dengue; hookworm and clonorchiasis; climatic bubo.

Vergely (Auguste). Quelques notes sur la pathologie brésilienne. [**Notes on the Pathology of Brazil.**]—*Jl. Méd. de Bordeaux.* 1927. Sept. 25. Vol. 104. No. 18. pp. 687–696.

A discursive address from a surgeon who has practised for many years in the State of S. Paulo. Information is given of the diseases met with.

A. G. B.

Denny (C. R.) & Nicholls (Lucius). **Melioidosis in a European.**—*Ceylon Jl. Sci.* (Sect. D. Med. Sci.). 1927. Mar. 16. Vol. 2. Pt. 1. pp. 37–40. With 1 text fig. [6 refs.]

This disease has not been recorded before from Ceylon, and the fact of its occurrence in a European of good social position suggests the possibility of its being commoner than is supposed.

Clinically the diagnosis is difficult. In this patient there were pleuritic symptoms but no cough. These symptoms subsided, to be succeeded in 3 days by rise of temperature, diarrhoea, and enteric-like stools. Profuse night sweats and a septic type of temperature were marked features of the illness, which terminated in death 6 weeks from the commencement. It was found, however, that the patient had had slight fever for 2 or 3 weeks previously. Agglutination tests with organisms of the typho-coli group were negative, as also were blood films for malaria. One of the blood cultures developed a thick pellicle growth which was regarded as a contamination but was probably a growth of *B. whitmori*. That a diagnosis was made was due to the fact that some yellow pus had been withdrawn in a syringe when making exploratory puncture for empyema shortly before death. The pus gave a growth of *B. whitmori* and cultures, inoculated into guinea-pigs, showed caseation at the site of inoculation, peritonitis, enlarged spleen dotted with caseous areas, caseous areas in the liver, inflammatory patches in the lung and characteristic enlargement of the testicles with caseous degeneration.

Although *B. whitmori* is pathogenic for rats, and human infection may be acquired from them, this organism has, at all events, not been recognized in the thousands of rats examined in the course of plague work.

W. F. Harvey.

Pons (R.) & Advier (M.). **Melioidosis in Cochin China.**—*Jl. of Hyg.* 1927. Mar. Vol. 26. No. 1. pp. 28–30. With 1 chart in text.

Stanton (A. T.) & Fletcher (William). **Melioidosis. Notes on a Culture of *B. whitmori* from Saigon.**—*Ibid.* pp. 31–32.

——, —— & Symonds (S. L.). **Melioidosis in a Horse.**—*Ibid.* pp. 33–35. [2 refs.]

These three papers add to our knowledge of the disease melioidosis which has been so fully worked out by Stanton and Fletcher. Up

to the year 1925 it had only been reported from Rangoon, Kuala Lumpur and Singapore. It was thought unlikely, however, that this limitation was anything but accidental. In the first of the three papers we have an account of a case of the septicaemic form of the disease in a woman who died in Saigon. The causative organism, a short bacillus, motile and Gram-negative, *B. whitmori*, was isolated and the authors confirm the resemblance of its growth to *B. mallei*. It was very pathogenic to all laboratory animals and is comparable in this respect with *B. pestis*. The woman is held to have contracted the infection from an animal and not a human source. In the second paper an account of the biological characters and pathological effects of the strain isolated at Saigon is given. Two types of colony appeared on eosin-methylene blue agar, one of which was the ordinary rugose type, the other ultrarugose and very sticky. The organisms of both types of colony fermented lactose, saccharose, glucose, mannite, dulcite, maltose and dextrin but without gas. No indol was formed. The ordinary type of colony was agglutinated to full titre by immune serum, whereas the ultrarugose type only agglutinated to 33 per cent. of full titre. The Saigon strain is the most virulent of those hitherto isolated. In the third of the three papers the resemblance of melioidosis to glanders and the points which differentiate *B. whitmori* from *B. mallei* are referred to. The disease has been observed in man, rats, cats, dogs, guineapigs and rabbits, but the case here described is the first occurrence in a horse which has been reported. *B. whitmori* was isolated on several occasions from the intermittent purulent discharge from the nose and the serum of the affected horse agglutinated the type strain in 1–8,000, whereas that of 7 unaffected animals in the same stable did not give a titre above 1–200. The horse had been imported into the Malay States from Australia, and had to be destroyed 18 months after the first isolation of the causal organism from the nasal pus. At the autopsy no active lesions were found and *B. whitmori* was not isolated from the organs.

W. F. Harvey.

ROMITI (C.). **Surgical Treatment of Elephantiasis, being a Report to the Surgeon General of British Guiana.**—*Davson Centenary Fund, British Guiana. Theses submitted for the Award of the Gold and Silver Medals for the Triennial Period 1923–1926.* 15 pp. [n.d.] Printed by Waterlow & Sons Ltd., London.

In this paper, which deals exclusively with elephantiasis of the lower extremity, the author, after a reference to the different types of case enumerated by LEIPER in his report on filariasis in British Guiana, recommends surgical intervention in those cases in which enlargement of the limb is permanent. The only contra-indications for operation, apart from general constitutional considerations applicable to all surgical cases, is the presence of ulcers, septic dermatitis, or local infection of any kind. Complications such as these must of course be dealt with before operative measures are undertaken. Dr. Romiti operates under spinal anaesthesia by stovain, and practises a modification of KONDOLEON'S procedure, which aims at reducing the bulk of the affected structures, and maintaining this reduction by the establishment of free communication between the superficial and deep tissues. He operates first on the outer side of the limb, removing a broad,

but not too broad, wedge of skin and subcutaneous tissue, and resecting from the whole length of this incision a strip of deep fascia half-an-inch wide. To obviate any possibility of union taking place between these cut edges of aponeurosis they are "inverted and sutured at the bottom of the incision." A second operation with the same technique is carried out on the inner side of the leg some ten to fifteen days later. The whole procedure is simple and rapid, and the risk to the patient negligible.

The author discusses the anatomico-pathological changes in the integuments met with in cases which have come under his observation, and propounds several questions with regard to their aetiology which he hopes to be able to answer after more detailed pathological investigation. He appends an interesting and valuable table giving details and particulars of 45 cases operated on by the method described. Three of these were still under treatment when the report was submitted, but in 42 (in 12 of which both legs were dealt with) the immediate results were manifest and could be regarded as eminently satisfactory. Further investigation is promised, after a suitable lapse of time, with a view to ascertaining how far these good results may be regarded as permanent.

J. J. Pratt.

Connell (W. K.). **Elephantiasis of the Male External Genitalia.**—*Tanganyika Territory Ann. Med. & San. Rep. for the Year ending 31st December, 1926.* pp. 114–115.

A brief communication in which the author advances two methods of treatment of the denuded penis after radical excision of the elephantoid scrotum, his object being to provide the organ with a covering of whole-thickness integument in preference to having recourse to skin-grafting.

In the first or "Tunnel" method the penis is drawn through a four-inch subcutaneous tunnel on the inner aspect of the thigh, the edges of the divided preputial mucosa being stitched to the skin edges of the distal end of the tunnel. The base of the organ is covered by approximation of the flaps used to cover the testes. After three weeks, when healing is complete, the penis is freed from the thigh by an incision marking out lateral flaps of size suitable for the provision of skin clothing for the mobile organ, the steps necessary to close the wound left in the thigh being at the same time taken. An excellent result is said to have been attained in the one case to which this procedure has been applied.

In the second or "Granulating Flap" method, a flap about two inches wide and at least 10 inches long is dissected up from the thigh, and replaced and fixed in its original bed by sutures after sterile gauze has been placed underneath it. Three weeks later the distal end of this flap is obliquely divided, the whole flap is again raised and applied to the distal portion of the granulating penis like a roller bandage, only one turn being, however, taken on this occasion. After another fortnight the proximal end of the flap is severed and the process of bandaging the penis with skin completed. During this fortnight's interval it is necessary to keep the patient trussed up, with legs and thighs bandaged together and fixed in a position of flexion on the abdomen. The author has operated in this way successfully in two

cases, but notes that the ultimate cosmetic result is poor, that there is some risk of sepsis, and that the method has many disadvantages. To the reader these will be obvious.

J. J. Pratt.

Olivares (Rafael). Elefantíasis de escroto. Tumor de 50 kilogramos, operado y curado en un moro de la zona de Melilla. [**A Case of Elephantiasis of the Scrotum in a Moor cured by Operation.**] —*Rev. Española de Med. y Cirug.* 1927. Dec. Vol. 10. No. 114. pp. 707–713. With 8 text figs.

A case of elephantiasis in a Moor, aged 46 years. Symptoms were noticed some 8 years prior to his coming under the author's care. The tumour was very large, weighing 50 kgm. Operation for its removal, performed under spinal anaesthesia, is described in detail, the sites of the incisions being well shown in a diagram. The penis was found intact, not sharing in the growth, and the testes with the tunicae vaginales were also unaffected. The result was excellent.

The condition before and after operation is clearly shown by photographs. It was probably of filarial origin, but this was not proved.

H. Harold Scott.

Lotti (C.) & Puxeddu (E.). Ulteriori ricerche sul favismo. [**Further Researches in Favismus.**]—*Sperimentale.* 1927. Oct. 14. Vol. 81. No. 4. pp. 415–448. [30 refs.] [Inst. of Med. Path., R. Univ., Cagliari.]

Favismus is the name given to the syndrome of anaphylactic nature with haemoglobinuria resulting from inhalation of the perfume of the flowers or from ingestion of the green seeds of the bean.

Two years ago, one of the authors (Lotti) produced haemoglobinuria in rabbits by intravenous injection of an extract of the plant [this *Bulletin*, Vol. 23, p. 231]. *In vitro* it produced marked agglutination of erythrocytes but not haemolysis. The flowers were found to produce the anaphylactic symptoms without haemoglobinuria, while the dried seeds acted as haemolytic agents and had but little anaphylactic effect; the green seeds combined both properties.

Only a certain number of the experimental animals suffered from haemoglobinuria, which appeared to result in part from the toxicity of the seeds depending on the degree of their ripeness, and in part on the individual susceptibility of the animal injected.

If to the fresh juices of the plant inactivated human serum is added the haemolytic effect is not increased *in vitro*; if, however, a substance (such as histamine) having a selective action on the vessels is added, haemoglobinuria occurs in rabbits previously sensitized, but not in fresh animals.

Several series of experiments were set up to demonstrate these points and protocols are given of these, together with those of control experiments to eliminate other possible factors.

The last part of the paper is of a chemical nature showing the modifications of the calcium and potassium present in the serum resulting from the anaphylaxis and from the haemoglobinuria. The amount of calcium, according to the estimations, varies between wide limits in the rabbit, namely, 11·2 and 22 mgm. per cent., with an

average of 16 mgm. ; the potassium between 19·25 and 29·37 with an average of 26 mgm. per cent., and the K:Ca quotient between 1·15 and 2·40, with an average of 1·61.

Intravenous injection of the extract of the plant leads to an increase in the potassium, though transitorily. It is inferred that the anaphylactic shock and the haemoglobinuria have the same basic cause, an alteration in the pH in the blood-plasma, though there are other factors at present unknown. These plasma changes may have some bearing on the production of haemoglobinuria in malaria.

H. Harold Scott.

Torres (C. Margarinos). Sobre uma nova entidade morbida do homem, caracterizada por meningo-encephalo-myelite, myosite e myocardite aguda diffusa congenitas, associadas a presença, nos respectivos tecidos, de um novo parasito, *Encephalitozoon chagasi*, M. Torres, 1927. [**A New Disease in Man, characterized by Meningo-Encephalo-Myelitis, Myositis and Acute Diffuse Congenital Myocarditis, with a New Parasite** *Encephalitozoon chagasi* **in the Tissues.**]—*Brasil-Med.* 1928. Jan. 7. Vol. 42. No. 1. pp. 1–4. With 10 text figs. & 4 figs. on 1 plate. [158 refs.] [Oswaldo Cruz Institute, Rio de Janeiro.]

A child died, 2 days old, at the Maternity Hospital in Rio de Janeiro. The only symptoms during life were a persistent contracture and, shortly preceding death, generalized convulsions. At the autopsy, numerous opaque yellow foci, the size of rice-grains, mostly discrete but some confluent, were seen in the brain, both in the grey and white matter. Microscopically, intracellular bodies like those denominated Toxoplasma and Encephalitozoon were found aggregated as in the "cysts" of *Trypanosoma cruzi*, each constituent being ovoid, staining red with eosin and enclosing a single granule staining blue with haematoxylin ; there was nothing of the nature of a blepharoplast visible. They were found in the neuroglia cells and, in addition to the brain, were present in the cells of the subcutaneous fat, the striped fibres of the myocardium and skeletal muscles. In each aggregation there were about 15 elements in the cells of the subcutaneous fat ; in the brain were some with 12 and others with as many as 70. In the myocardial cells the "cysts" measured about 31 by 10 microns and contained 60 bodies or more. The largest were in the skeletal muscles, 41 by 10 microns, containing 100 to 150 of the bodies. The cytoplasm stains uniformly, the nucleus is very small (1 micron) but the periphery takes on a deeper stain as if there were chromatin granules in a nuclear membrane.

They were not found in the spleen, liver, kidneys, or thymus. Sections of the brain and spinal cord revealed small inflammatory foci similar in size and structure to those of Chagas's disease and experimental toxoplasmosis ; these were made up of mononuclear cells, but not distributed particularly round the vessels.

The author discusses the question of the congenital source of the condition and compares it with Chagas's disease ; invasion may be directly through the chorionic villi from maternal infection. Examination of the blood of the mother two months after the death of the infant showed anaemia, with a colour index of 0·7 and a relative monocytosis of 25·5 per cent.

H. Harold Scott.

Hahn (E. Vernon) & Gillespie (Elizabeth Biermann). **Sickle Cell Anemia. Report of a Case greatly improved by Splenectomy. Experimental Study of Sickle Cell Formation.**—*Arch. Intern. Med.* 1927. Feb. 15. Vol. 39. No. 2. pp. 233–254. With 8 text figs. [16 refs.]

From these comprehensive and instructive studies, which are largely and fruitfully experimental, the authors come to regard the phenomenon of sickling of the red cells observed in sickle-cell anaemia not as itself a disease—since it is consistent with good health and long life ; but as signalizing a congenital predisposition to haemolytic anaemia.

Their studies are based on the case of a negro boy of four years whose symptoms were all explicable on the ground of severe anaemia, except for attacks of epigastric pain. All things considered—including adequate evidence from the laboratory—the case might have been set down as acquired haemolytic jaundice, except for the increased resistance of the red cells. Diagnosis was finally established when typical sickle cells developed in sealed wet blood smears kept for 24 hours at room temperature—and reverted to a circular form in two weeks. Splenectomy was followed by rapid improvement of symptoms, but the sickle-cell trait persists. Pieces of the fresh spleen pulp were fixed at once, some in formaldehyde, and some in Zenker's solution ; in the former when subsequently examined the red cells were elongate, or filiform, or crescentic ; in the latter they were of normal appearance. From these significant observations, confirmatory of other observers, the authors conclude that " the sickle cell is not a distorted cell produced as such by the erythropoietic tissue," but is a distortion dependent on circumstances. In investigating the nature of the tortive circumstances they were guided by an observation which suggested that oxygen tension was a promising line to follow. The following are their conclusions and inferences :—

" 1. The red corpuscles of persons with the ' sickle cell trait ' are transformed into sickle cells *in vitro* as a result of asphyxia. The transformation takes place when the oxygen tension falls below a partial pressure of 45 mm. of mercury, provided the hydrogen-ion concentration is within certain limits probably always on the acid side of pH 7·4.

" 2. The sickle distortion is a reversible phenomenon. Oxygen and carbon monoxide induce restoration of the discoid form.

" 3. All of the facts relating to sickle cells are consistent with a hypothesis that the sickle form is stable when the hemoglobin is dissociated, and that the discoid form is stable when the hemoglobin is combined.

" 4. The influence of hydrogen-ion concentration in the sickle reaction is probably related to its influence on the dissociation of oxyhemoglobin.

" 5. Sickle cell formation *in vivo* is probably induced or increased by anoxemia.

" 6. Disease of the heart and lungs probably plays an important rôle in causing excessive hemolysis when it occurs in persons with the sickle cell trait.

" 7. Reasons exist for believing that the only specific cause for active sickle cell anemia is the unique hereditary anomaly of the red corpuscles which predisposes to it . . .

" 9. The spleen probably plays a secondary rôle in the excessive hemolysis of active sickle cell anemia and is damaged in the process, passing through stages of enlargement to ultimate atrophy.

" 10. The influence of the spleen is not the cause of the sickle cell trait."

The authors propose the terms " drepanocyte," " drepanocytaemia," and " drepanocytic-anaemia," respectively, for " sickle cell," " latent sickle-cell anaemia," and " active sickle-cell anaemia."

A. Alcock.

GRAHAM (George S.) & MCCARTY (Sarah H.). **Notes on Sickle Cell Anemia.**—*Jl. Lab. & Clin. Med.* 1927. Mar. Vol. 12. No. 6. pp. 536–547. With 4 text figs. [14 refs.]

This is an excellent, philosophic discourse upon sickle-cell anaemia—a condition for which the authors propose the term " meniscocytosis " [a term that comes into competition with " drepanocytaemia," proposed by HAHN and GILLESPIE, and may therefore be not free for general acceptance]. Most of the matter is now familiar—the race-limitations, the heritage, the inherent latency, the physical and clinical phenomena, etc., and the general resemblance to haemolytic jaundice except in the increased, instead of diminished, resistance of the red-blood cells to haemolysis. The authors emphasize the frequency of latency; among 608 negro patients of all descriptions they discovered its existence in 54 instances. They also note an inconsistency with long life; of 58 cases only 2 were over 50 years of age. They have studied 4 cases *post mortem*, and find in all four common evidence of an abnormal rate of destruction of red blood cells. In their conclusion they regard " meniscocytosis " as a condition—a " demonstrable stigma of an inheritable blood dyscrasia " predisposing to a characteristic anaemia-syndrome; and a " warning signal " of a susceptibility to infectious disease, particularly of the respiratory tract.

A. A.

HEIN (Gordon E.), MCCALLA (R. L.) & THORNE (G. W.). **Sickle Cell Anemia. With Report of a Case with Autopsy.**—*Amer. Jl. Med. Sci.* 1927. June. Vol. 173. No. 6. pp. 763–772. With 4 figs. on 2 plates & 1 chart. [17 refs.]

After five pages of general introduction to the subject the authors describe their own observations of a case of sickle-cell anaemia in a negro of 20 years who eventually died (a year after leaving hospital) of a perforating duodenal ulcer. The patient, whose mother also exhibited the " sickling " phenomenon, had always been jaundiced, had suffered intermittently from pains in various joints since infancy, and later in life had leg ulcers (and also periodic fits of epigastric pain, with vomiting). When admitted to hospital he had fever, jaundice, and epigastric pain, an enlarged heart, and a loud apical systolic murmur. When first examined 90 per cent. of the red blood corpuscles sickled in 24 hours. *Post mortem*, the heart was " approximately twice normal size, the enlargement chiefly in the left ventricle," and " extreme splenic atrophy and general signs of increased haemolysis were prominent features."

A. A.

STEWART (Walter Blair). **Sickle Cell Anemia: Report of a Case with Splenectomy.**—*Amer. Jl. Dis. Children.* 1927. July. Vol. 34. No. 1. pp. 72–80. With 3 text figs. [18 refs.] [School of Med., Univ. of Pennsylvania & Univ. Hosp.]

The patient in this case is a male child between 5 and 6 years old who appears to have been sickly and weak since the age of 5 months.

The father is a healthy white man with normal blood. The mother is white but with the features and the dark skin of a Cuban; slight sickle-cell formation was observed in her blood. Neither parent is aware of any negro in their pedigree. There are four other children (all girls) one of whom has slight sickle-cell formation.

The patient seems to have been in the hands of physicians pretty constantly since the age of 5 months, and to have had his blood critically examined pretty frequently, but it was not until he was more than 5 years old that sickle-cells were observed.

At the age of 16 months the spleen and liver were observed to be enlarged and all the palpable glands except the epitrochlear. At the age of 2½ years the diagnosis of pernicious anaemia was made. At 4 years he was under treatment for acute pain in the upper part of the abdomen, and tender ankles; both the spleen and the liver had now *decreased* in size; enlarged tonsils and adenoids were removed. Subsequently, at intervals, crops of macules resembling pityriasis appeared, and the abdominal pain recurred. Finally, when the sickling was observed, the spleen was removed, since the patient had been ill all his little life and continued to suffer from secondary infections at frequent intervals. But two months afterwards, although recovery from the operation was rapid, the general condition shows little change and the sickle formation continues.

The removed spleen weighed only 46 gm.; the malpighian bodies were just visible. Microscopically, the "intense congestion of both pulp and sinuses masks most of the other features except for a peculiar fibrosis and localized calcification. The malpighian bodies are much diminished in size. There is extreme calcification of the smaller and larger vessels. There are distorted scarred areas, with much haemosiderin."

A. A.

Ievers (C. L.). **Note on the Treatment of Ulcers.**—*Tanganyika Territory Ann. Med. & San. Rep. for the Year ending 31st December, 1926.* pp. 102–103.

Premising that ulcer is one of the commonest incapacitating conditions from which Africans suffer the author describes his treatment, which is a modification of that recommended by a Danish surgeon. The general treatment is that appropriate to syphilis, yaws, ankylostomiasis, food deficiency or whatever condition is found to predispose to or cause the ulcer.

"1. When the patient presents himself with a foul sloughing ulcer the sore is thickly dusted with powdered potassium permanganate which, with the serum of the wound, forms a black paste. The wound is bandaged and left for three days and the patient is given 20 grains of potassium iodide daily. He is warned that the pain will be great; but hardly ever removes the dressing. All patients are given an iron and arsenic tonic as a routine and only rarely is it necessary—in cases of extreme anaemia—to give an intravenous injection of neokharsivan.

"2. When the dressing is removed the wound will be wonderfully improved. It may be necessary to complete the 'toilet' of the wound by removing pieces of sloughing skin or tendon under chloroform; but this is not usual.

" 3. The patients then undergo the following routine treatment daily: Each is given 20 grains of potassium iodide and half an hour later they are placed sitting in a row the ulcers being covered with plain gauze which is kept soaked in potassium permanganate solution (1–500)—the bottle passing from hand to hand. This is done for two hours, the ulcers are then exposed to sunshine for one hour, and afterwards treated with a dry dressing. The following morning the treatment is repeated.

" 4. As a rule the results are very good indeed under this treatment, the wounds rapidly contract in size and begin to granulate. A brisker treatment is instituted for those that seem to lag and they are stimulated with iodine and dressed with B.I.P.; but the permanganate routine treatment continues in all cases.

" 5. When the wounds are clean, healing and contracting, but hollows remain to be filled up they are treated with normal saline on the gauze each morning for two hours, instead of permanganate, and moist dressings instead of dry.

" 6. A certain percentage of the ulcers, owing to the large area of skin destroyed, require to be skin grafted. This is always advisable as the soft skin of the grafts breaks up the hard scar area and probably prevents subsequent cracking and " breaking down." The permanganate and potassium iodide routine treatment is now discontinued. The skin grafts —shavings from the thigh—are easily put on; the dressings should be left for four or five days—in spite of the smell—before they are removed and in 90 per cent. of cases some of the grafts at least will have taken and will rapidly hasten healing under simple ointment or moist boracic dressings.

" I may add that it is advisable during the rains to cover the dressings with strips of banana leaves which have been smoke dried and treated with an antiseptic, as the patients will not stay in bed and soil their wounds and dressings walking in the mud—to which dirty element banana leaves are almost impervious."

A. G. B.

REMLINGER (F.). Sur la fréquence à Tanger de l'hématurie dite essentielle. [**The Frequence at Tangier of So-called Essential Haematuria.**]—*Bull. Soc. Path. Exot.* 1927. Dec. 14. Vol. 20. No. 10. pp. 989–991. [1 ref.]

The author has been at Tangier since 1911 and has followed up several cases of haematurea for 15 years without the development in the subjects of tuberculosis, cancer or stone. He has seen about 12 cases, only 2 of which were in women. The blood is so evident that the patients themselves—men of 20–50 years—make the diagnosis. There are none of the usual antecedents to haematuria and no pain nor malaise of any kind. The blood is of renal origin. There are no parasites nor micro-organisms. In 24 or 48 hours the bleeding stops and the patient resumes his vocation, and in only two instances has there been a recurrence. The author refers to a paper by D'ANFREVILLE (1915) on haemorrhages in Morocco in which it is stated that, apart from tuberculosis, patients at Rabat with a " congesting tendency " produce blood-stained sputa at the hottest time of the year. The author has not observed any relation between haematuria and season or meteorological events. Other kinds of haemorrhage do not appear to be commoner at Tangier than elsewhere. [The nationality of the patients is not given.]

A. G. B.

SEYFARTH (Carly). Ueber Hodgkinsche Krankheit (Lymphogranulom) mit periodischen Fiebersteigerungen. [**Hodgkin's Disease with Periodical Rises of Temperature.**]—*Abhandl. a.d. Gebiet d. Auslandskunde. Hamburg. Univ.* 1927. Vol. 26. (D., Med. & Vet. Vol. 2.) [Festschrift NOCHT.] pp. 517–531. With 6 charts. [34 refs.] [Med. Clin., Univ., Leipzig.]

Seldom, if ever, does a case of Hodgkin's disease run its full course without pyrexia and recurrent bouts may give rise to difficulties in diagnosis.

Three cases recently observed by Seyfarth are cited in which periodic attacks of pyrexia were noted. Two had definite and palpable enlargement of lymph glands, while the temperature charts, which are reproduced, show the periodic rises of temperature with regular intervening span.

The initial stages of the disease are remarkably uniform. The majority of the patients complain of fever, rigors, weakness, emaciation, fatiguability and night sweats, and often added to these are digestive disturbances, diarrhoea, constipation and, more rarely, vomiting. In these pyrexial forms of Hodgkin's disease the gradual painless enlargement of the cervical lymph glands seldom forms the earliest sign. The periodic and striking rises of temperature are by far the most characteristic. Ten or even twenty of these regular pyrexial attacks have been recorded. The temperature curves in the many recorded cases are scarcely compatible; generally speaking they last 10–14 days with a somewhat shorter intervening apyrexial interval. ROSENTHAL and others have recorded typhoid-like charts of continued pyrexia lasting three to four weeks. On the other hand, short sharp malaria-like temperatures of one to three days' duration have been described.

In Seyfarth's first case a five-day fever alternated with seven days apyrexia, but generally there is a recurrent type of undulant fever. During the fever the patient feels ill and suffers from headache, pains in the back and limbs, and drenching sweats. A typhoidal state may supervene or delirium or even coma; while during apyrexia all symptoms may disappear. These recurring attacks undermine the patient's strength. With each fever attack the anaemia becomes more severe, the spleen enlarged and the swelling of the lymph glands more noticeable. There are cases, as in the first of the present series, in which no noticeable lymphatic enlargement was noted, thereby making the diagnosis difficult, or even impossible. This form of Hodgkin's disease can therefore be divided into two main groups, one with palpable enlargement of external lymph glands, the other in which the internal sets are affected, and which can progress to a fatal termination without any external inkling of what is taking place. Generally speaking, however, some enlargement of the supra-clavicular or axillary group is noted prior to a fatal termination.

The enlargement of the tracheo-bronchial and mediastinal lymph glands can be ascertained by percussion or by skiagraphy. The mesenteric, retroperitoneal and lumbar glands and those at the portal fissure are the most difficult to recognize. The liver is generally moderately enlarged and the spleen is palpable, but sometimes the enlargement can be ascertained solely by percussion. In children, especially, the spleen may reach to the symphysis. Haemic murmurs are present in the cardiac area, and the pulse is generally accelerated.

The skin, as PEL originally remarked, shows a distinct sub-icteric tint ; generalized icterus is common towards the fatal termination. On blood examination a progressive secondary anaemia is noted, while the onus of blood destruction falls on the haemoglobin. Usually there is a moderate leucopenia (3,000–5,000), but sometimes a moderate leucocytosis is noted.

The duration of the illness to a fatal termination varies within wide limits ; on an average it lasts 15 months up to four years. The ætiology is at present quite undetermined, while the differential diagnosis has to be made from undulant fever, relapsing fever, malaria, typhoid and paratyphoid, kala azar, sepsis, ankylostomiasis, leukaemia, tuberculosis, abdominal sepsis and tumours.

Therapeutic measures are on the whole of little avail. X-ray therapy seems to check the disease for a while and arsacetin is the most useful drug.

P. H. Manson-Bahr.

MONTPELLIER (J.), CATANEI (A.) & COLONIEU (L.). La glossite de Jamin ; étude clinique et remarques étiologiques à propos de cas observés à Alger. [**Study of Glossitis of Jamin seen at Algiers.**] —*Bull. Soc. française Dermat. et Syph.* 1927. July. No. 7. pp. 471–475. With 1 fig. [6 refs.]

—— & COLONIEU (L.). Une nouvelle glossite, la " langue de Jamin." —*Rev. Prat. Malad. des Pays Chauds.* 1927. Oct. Year 6. Vol. 7. No. 10. pp. 510–521.

In 1925 JAMIN described under the term " stomatite d'automne " cases of a peculiar glossitis seen in Tunis during the preceding eight years. Similar observations were made by NOGUE, MATHIS and GUILLET at Dakar (this *Bulletin*, Vol. 22, pp. 982 ; 983). The present authors relate their experiences with the same affection seen in Algiers. Their description of the disease differs in no material point from that given by previous authors. Cultures on Sabouraud medium gave in six out of twenty cases a Monilia, four of which had the same characters as a fungus recently isolated from a case of thrush invading the tongue ; one differed in culture reactions and a fourth was comparable with *M. albicans*. In discussing the aetiology reference is made to the associated gastro-intestinal symptoms found by some observers but not present in the cases now described ; the chemical factor due to chewing was also absent and there was no seasonal variation. The disease is considered to be due not to the fungus but some infection as yet unknown.

H. S. Stannus.

STA. CRUZ (J. Z.). **The Pathological Incidence of Lobar Pneumonia in the Philippine Islands.**—*Jl. Philippine Islands Med. Assoc.* 1927. May. Vol. 7. No. 5. pp. 162–170. [8 refs.] [Coll. Med., Univ. Philippines, Manila.]

The summary and conclusions of this paper, the observations in which are supported by five tables are, in part, as follows :—

" 1. In 12,000 autopsies performed in the City Morgue of Manila during a period of eighteen years, 400 were primary lobar pneumonia cases, an average of one lobar pneumonia case for every 30 autopsies. The overwhelming majority of the cases were Filipinos.

"2. There were cases of lobar pneumonia every year and almost every month, but the increased seasonal death rate in this country coincides with the cold north-east monsoon and is due mostly to the extreme cold and the abrupt daily changes of temperature during the period from December to March. Although epidemic of lobar pneumonia is not known in the Philippines, epidemics of influenza can greatly affect the mortality from pneumonia, as shown in the records for 1918.

"3. The greatest susceptibility as well as the greatest mortality of lobar pneumonia can be said to occur between the ages of 11 and 40 years; the disease is more than twice as common in men as in women. Lobar pneumonia cannot be called the "friend of the aged" in the Philippines.

"4. The right base is affected in the majority of the cases but it is not so severe or so frequently fatal as is the hepatization of the left base. Pericarditis is often the complication of the left base. Apical pneumonia of the right side was rather frequent in this series; it occurred in all ages without showing predominance in children. Massive pneumonia of the right base is more frequent and the mortality is higher than in that of the left."

A. G. B.

DUYCK. Traitement des pneumococcies par injections hypodermiques de liquide d'épanchement pleural. Note préliminaire. [**Treatment of Pneumococcus Infections by Hypodermic Injections of Pleuritic Fluid.**]—*Bull. Méd. du Katanga.* 1927. Oct. Vol. 4. No. 3. pp. 87–93.

It is found that natives acclimatized to the Katanga, Belgian Congo, contract pneumonia, whereas recruits from Ruanda-Urundi, when they come down from their mountains to the Tanganyika plain, are virgin soil for infection and react to the pneumococcus, like young children to the tubercle bacillus, by blood generalization. Both groups, however, appeared to benefit from the treatment described. Pleuritic fluid is withdrawn by syringe in the 4th or 5th intercostal space in the right anterior axillary line or the left posterior axillary, with the patient's assistance by his forced inspiration and expiration. About 10 cc. are thus extracted for two or three times and re-injected under the skin. About 100 injections have been made with no untoward result. Of 27 cases of pneumonia treated exclusively by this method all did well but one, and in this case treatment was too late. It is essential that it be undertaken early; the size of the dose matters little. Of 18 patients with pneumococcal septicaemia all recovered. Each received one, two or three injections of 1–10 cc. The diagnosis was based on the discovery of the pneumococcus in the blood by culture or in the cerebrospinal and pleuritic fluid. The author thinks it premature to draw any definite conclusion from these figures.

A. G. B.

MARSHALL (Harold K.). **Influenza in Fiji.** [Correspondence.]—*Jl. Amer. Med. Assoc.* 1927. Dec. 17. Vol. 89. No. 25. pp. 2133–2134.

Dr. H. K. Marshall, who in the influenza epidemic of 1918, was a member of the medical service of Fiji, gives some interesting instances of the effectiveness of isolation of communities against infection. While British Samoa was ravaged by influenza, American Samoa, 60 miles away, port from port, with efficient quarantine, remained free. The island of Rotumah, 200 miles north of the main Fiji group,

escaped because communication was interrupted for three months. The Makogai Leper Asylum, Fiji, of which the writer was in charge, on a small island 14 miles from the nearest port, Levuka, with 400 population escaped entirely till August, 1919, though to obtain supplies trips were made to infected Levuka.

A. G. B.

Donnison (C. P.). **Observations on Some Cases of Displaced Heart in the African Native.**—*Kenya & East African Med. Jl.* 1927. Nov. Vol. 4. No. 8. pp. 241–247.

In the course of examination of labour recruits cases were encountered where the cardiac impulse was displaced outwards or outwards and downwards. In 9 months' observation 16 such cases were noted; three had aortic incompetence, in one there was enlargement with myocardial failure, in two adherent pericardium and fibrosis of lung. In the remaining ten there was no obvious cause and it is this group which is here studied. All were African males, between 15 and 45, of good physique and apparently healthy (other age periods and females were not under examination). Five had been at work on farms or railway and had satisfactorily completed their contract. All came from one of two districts on the shore of Lake Victoria. The outward displacement varied between $4\frac{1}{4}$ and $5\frac{1}{4}$ inches from the mid-line and in six the impulse appeared in the 6th space. Percussion showed that the cardiac dulness was not increased upward or to the right. X rays were not available. A careful examination with the patient in various positions indicated that there was no enlargement of the heart, only displacement. In 8 cases auscultation revealed that the second sound at the mitral and aortic areas was slightly accentuated; bruits were noted in 2 cases. The pulse showed nothing unusual. In every case there was enlargement of spleen to two or three fingers below the costal margin, or more. Of 7 blood examinations 3 showed subtertian parasites. A running test indicated that the heart was not affected in function.

The author discusses possible causes, noting the enlarged spleens, the malarious localities from which the men came, and the malarial infection of some, and concludes that "it is exceedingly difficult to find any suitable explanation for the condition." It appears to involve no serious incapacity and the subjects were passed for any but very heavy manual labour.

A. G. B.

Roegholt (M. N.). Het genito-rectale syndroom. (Het ulcus molle als oorzaak van elephantiasis labiorum, praeputii clitoridis en olitoridis, ulcus recti en strictura recti, strictura vaginae; en een enkele maal van elephantiasis penis en scroti). [**The Genito-rectal Syndrome.**]—*Nederl. Tijdschr. v. Geneesk.* 1928. Jan. 7. 72nd Year. 1st Half. No. 1. pp. 15–25. With 17 figs. on 1 plate.

This article concerns the same subject of tropical surgery which the author has already dealt with (see this *Bulletin*, Vol. 24, p. 151), but now he considers from the same point of view several genital and rectal affections, which he joins together as the genito-rectal syndrome. The soft chancre with its abundant discharge and its

tendency to spread along the lymph channels is considered to be the common cause of these affections. Cultures from open ulcers did not succeed, but from closed bubonic abscesses Ducrey's bacillus was cultivated and inoculation into the skin of a patient of scrapings from her own rectal ulcer caused a typical ulcus molle. Four cases are quoted in some detail and the figures illustrate the various affections which the author deals with and which are actually very common in the Malay. The different anatomical conditions and the greater obstacles to treatment of the primary sore in women give an explanation of the prevalence of the genito-rectal syndrome in the female.

W. J. Bais.

Hughes (T. A.) & Shrivastava (D. L.). **Observations on Tropical Cirrhosis of the Liver with Special Reference to the Fragility of the Red Blood Cells.**—*Indian Jl. Med. Res.* 1927. Oct. Vol. 15. No. 2. pp. 427–435. With 4 text figs. [28 refs.] [King Edward Med. College & Mayo Hosp., Lahore.]

"The observations upon which this paper is founded were made in the Mayo Hospital, Lahore, on a series of cases some of whom showed enlargement of the spleen and liver or enlargement of the spleen only, while others had cirrhotic livers with or without splenomegaly. One group gradually merged into the other, so that it is probable that both conditions resulted from different degrees of the same pathological process. All the patients had a history of chronic malaria with irregular bouts of fever, and coming from the Punjab were presumably infected from childhood. The non-cirrhotic cases were all more or less anaemic, the anaemia being of a secondary type with leucopoenia, and showed evidence of increased blood destruction by the presence of urobilinuria and hyperbilirubinaemia. Many of those admitted during the fever season (October and November) suffered from irregular pyrexia in hospital, but no malarial parasites were found in the peripheral blood. None were jaundiced and none had haemorrhages."

The relation to malaria is discussed. The conclusions are as follows :—

"1. A condition beginning with splenomegaly and leading to enlargement and eventually cirrhosis of the liver is described as occurring in persons subject to repeated malarial infections.

"2. In this early stage of the condition there is generally increased fragility of the red blood cells in hypotonic saline solutions.

"3. In advanced cases this fragility disappears and there may be increased corpuscular resistance."

A. G. B.

Lichtenstein (A.). Een geval van haemolytischen icterus (type Hayem). Onderzoekingen en beschouwingen naar aanleiding daarvan. [**Case of Haemolytic Icterus. Consideration of its Etiology.**] —*Geneesk. Tijdschr. v. Nederl.-Indië.* 1927. Vol. 67. No. 3. pp. 369–379. [15 refs.]

The paper describes a case of haemolytic icterus in a Javanese soldier. The symptoms, which were classical, were as follows : Icterus, enlarged spleen, bilirubinaemia without bilirubinuria, urobilin in urine and faeces, fragility of erythrocytes. Notwithstanding his condition the patient's heavy duties were carried out without inconvenience. The disease had undoubtedly been acquired for less than two years previously he had

been passed for military service. The patient refused splenectomy and returned to duty. A later examination showed no change in the condition except for an increase of red blood cells and haemoglobin.

C. M. Wenyon.

PHELPS (B. M.) & MALLORY (F. B.). **Toxic Cirrhosis and Primary Liver Cell Carcinoma complicated by Histoplasmosis of the Lung.** —*Fifteenth Ann. Rep. Med. Dept. United Fruit Company, Boston, Mass.* 1926. pp. 115–123. With 5 text figs. [4 refs.] [Truxillo Railroad Co. Hosp., Honduras & Path. Lab., Boston City Hosp., Boston, Mass.]

"A report is made of a case of toxic cirrhosis of the liver which gave rise to a primary liver-cell carcinoma, and which was complicated by a terminal broncho-pneumonia due to *Histoplasma capsulatum*, the fifth reported case of this disease as far as known.* The organisms were found to be strongly Gram-positive, and by the use of the aniline-blue connective tissue stain, were shown to possess very definite capsules which remained behind in the phagocytic cells after the death of the parasites."

A. G. B.

MACQUEEN (John). **Four Cases of Tetanus following Intramuscular Injection of Quinine.**—*Lancet.* 1927. June 18. pp. 1289–1290.

These cases, in adult males, occurred in Haifa in the year 1925. The salt used was the bihydrochloride in 50 per cent. solution recently prepared and sterilized in the autoclave. The injection was made into the glutei, the skin being prepared with 3 per cent. tincture of iodine. Needles and syringe were boiled and needles boiled again between injections. The incubation periods were 27–28 days, 21 days, and 11–12 days. All infections were acute and ended fatally. Other patients injected from the same bottles remained well. The author believes that the infecting spores were introduced at injection, and thinks that these cases provide a further argument in favour of the oral as compared with the intramuscular route. [He does not mention the intravenous route.]

A. G. B.

SICÉ (A.). Notes sur la lymphangite endémique dans le sud de Madagascar. [**Endemic Lymphangitis in the South of Madagascar.**] —*Bull. Soc. Path. Exot.* 1927. May 11. Vol. 20. No. 5. pp. 422–426. [3 refs.]

This paper is based upon 5 cases, two of which were acute and followed attacks of bubonic plague and three chronic, with attacks at long intervals, in which a streptococcus was isolated. These last read like filarial lymphangitis; examination of both day and night blood did not reveal microfilariae and there was no eosinophilia. The author has found filaria (*F. bancrofti*) in three south Madagascar

* *Histoplasma capsulatum* was described by DARLING from the viscera of a patient in Panama. "It has been suspected that the parasite may be a yeast-like organism." (STITT.)

patients, but he notes that the three patients came from Reunion and Mauritius, where symptoms were first noted. He doubts the role of filaria in endemic (or tropical) lymphangitis.

A. G. B.

IBRAHIM (Ali). **The Relation of Funiculitis to Hydrocele in Egypt.**—*Lancet.* 1927. Aug. 6. pp. 272–274. [4 refs.]

Cellulitis of the spermatic cord is a fairly frequent condition in the East. The author has found it common in Egypt, for during the four years 1921–1924 105 cases were admitted to hospital at Kasr-el-ainy and about twice as many were treated as out-patients. Nevertheless they represent a very small percentage of the total incidence of the disease which is frequently so mild and of such short duration that hospital advice is not sought. It occurs most usually-between 15 and 30 years of age. Three varieties are recognized, (1) gangrenous, (2) suppurative and (3) non-suppurative. These three types are carefully described. Repeated attacks almost always produce hydrocele and funiculitis may be regarded as the chief cause of the idiopathic hydroceles so prevalent in Egypt. The author considers that the effusion in the tunica vaginalis as result of the permanent obstruction of the testicular lymphatic drainage following one or more attacks of funiculitis, resembles the elephantiasis as the end result of repeated attacks of lymphangitis, the underlying cause in both being probably a filaria and the exciting cause a form of streptococcus.

R. T. Leiper.

MACKENZIE (Louis H. L.). **Lathyrism in the Gilgit Agency.**—*Indian Med. Gaz.* 1927. Apr. Vol. 62. No. 4. pp. 201–202.

A propos of MCCARRISON'S paper on Lathyrism in the Gilgit Agency [this *Bulletin*, Vol. 24, p. 676] the author says he was in Gilgit from 1921–1924 and in his last year became aware of the existence of the condition. A scout was referred to him for examination as to fitness, on the ground that he had the symptoms of a well known local disease, paralysis of the legs, which is considered incurable, and hence is not seen in hospitals. The disease occurs in males and is attributed to the eating of "gharash" grown in newly cultivated land; after some years' cultivation the poisonous property disappears. The author saw about a dozen cases. The symptoms were spasticity of legs and thighs, with good general health. A specimen of "gharash" sent to Major CHOPRA was identified as *Lathyrus sativus*. These cases occurred some 25 miles from the place described by MCCARRISON.

A. G. B.

YOUNG (T. C. McCombie). **A Field Study of Lathyrism.**—*Indian Jl. Med. Res.* 1927. Oct. Vol. 15. No. 2. pp. 453–479. With 9 figs. on 4 plates. [8 refs.] [Summary appears also in the *Bulletin of Hygiene.*]

A field study of lathyrism in certain selected areas in Central India. The report contains a detailed account of the clinical features of this

disease but is particularly valuable on account of the careful study made of the agricultural, economic and food habits in the areas studied. These are too detailed to be summarized and only some of the most important conclusions can be mentioned. Discussing two causation theories which have been advanced the author finds no evidence that germination of the lathyrus grain occurs or that an imported grain is the offender and that there is no evidence of the formation of a poisonous amine formed in connexion with germination. The second theory, that the symptoms are due to contamination of *Lathyrus sativus* by the weed *Vicia sativa*, he finds also to be devoid of foundation in the area of his investigations.

Lathyrism is due to an excessive predominance of the legume *Lathyrus sativus* in the diet, but this is not the whole of the problem. Lathyrism is pre-eminently a famine-year phenomenon, it is one of the pains and penalties of poverty and malnutrition. In such a year the other crops fail and only the lathyrus grows. The people are ill-fed and half starved and in that condition the bulk of the population has to live chiefly on the lathyrus and on such imported grains, largely composed of lathyrus, as they can obtain. Three months of such diet brings an abundant crop of lathyrism cases, beginning in July and continuing till the resumption of a better balanced diet in September and October. In a year of normal rainfall only those whose circumstances of life approximate to famine conditions acquire lathyrism and the striking feature of a pre-lathyrism diet, apart from the preponderance of lathyrus, is the absence from it of the protective vitamins, notably fat-soluble A. In an area in which lathyrism is particularly prevalent, the deficiency disease " night blindness " is also notoriously prevalent. In a Mohammedan village using as much *Lathyrus sativus* as their Hindu neighbours, but supplementing their diet by substances which tend to restore the dietary balance, lathyrism is unknown.

The author puts forward the following view : " It may tentatively be suggested for experimental verification that lathyrism may be to some extent a deficiency disease which is produced in persons living in a state of nutritional instability on a diet noticeably lacking in vitamin A, by a prolonged ingestion of a legume, the amino-acids of whose proteins are unsuitable as a diet and perhaps specially harmful, which is itself deficient in fat-soluble A."

The ultimate causes of lathyrism are economic and the author discusses various expedients to improve the economic status of the inhabitants.

W. G. Savage.

SAMPOERNO & SOETEDJO. Over het voorkomen van het amyloid in Indië [**The Occurrence of Amyloid Degeneration in the Dutch East Indies.**]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1927. Vol. 67. No. 4. pp. 574–578. [7 refs.] [Dutch Indies Med. School, Soerabaja.]

The authors assert that, contrary to the common opinion, amyloid degeneration is not very rare in the Malay. By systematical investigation in approximately 2,400 post mortem examinations they found amyloid degeneration in 20 cases. These are presented in tabular form. There appears to be some increase in its prevalence, which possibly

may be ascribed to the relative preponderance of chronic diseases amongst the causes of death in recent years. In only one case had there existed clinical evidence of amyloid degeneration.

W. J. Bais.

Doré (G. R.). Ictère hémolytique splénomégalique chez un hérédo-syphilitique porteur de lambliase cholédocienne. [**Haemolytic Jaundice with Splenomegaly in a Congenital Syphilitic with Lamblia in the Bile.**]—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1927. June 9. Year 43. 3rd Ser. Vol. 51. No. 19. pp. 810–813.

This is a critical account of a very carefully studied case of chronic haemolytic jaundice in a sickly young man of 25 years, where in the course of investigation a duodenal tube disclosed the presence of lamblia in the fluid drawn off. Having determined by experiment that the lamblia-infected bile had not an extraordinary haemolytic potency, the author excludes the presence of lamblia from the causation of a case difficult to distinguish from Addison's disease.

A. Alcock.

Émile-Weil (P.) & Grégoire (Raymond). Indications opératoires dans les splénomégalies primitives. [**Indications for Operation in Primary Splenomegaly.**]—*Presse Méd.* 1927. July 27. Vol. 35. No. 60. pp. 937–939. [2 refs.]

The authors class large spleens as (a) proliferative, of the order of tumours and (b) inflammatory with tendency to sclerosis, due probably to infections the nature of which may or may not be known. In the case of the proliferative spleens removal is not advised. These are leukaemic, in which better results are obtained by X-ray treatment, pseudo-leukaemic in which diagnosis is often difficult, Hodgkin's disease and sarcoma. The chronic inflammatory spleens are due to tuberculosis, syphilis, malaria, kala azar and to other unknown causes. Among the latter come the recently described mycotic spleens.

The authors begin by asking how it can be justifiable to remove a focus of infection which is of necessity secondary. They point out that the pre-existing blood infection may have been of short duration and infection be localized exclusively to the spleen, and to the objection that the removal of so important an organ is "antiphysiological" they oppose the arguments that the damaged organ no longer exercises its normal functions, that its work is taken over by other haematopoietic fields, that the removal of three-quarters of the infective agents enclosed in the spleen enables the relieved organism to defend itself against the remainder, and lastly that the damaged spleen is a source of danger to the liver and blood. Moreover, in cases of splenomegaly of long standing drug treatment not infrequently fails, e.g., emetine in schistosomiasis, quinine in malaria. They draw attention to the success of Salazar de Souza at Lisbon in the removal of spleens in infantile kala azar; nine recoveries out of 14 [see this *Bulletin*, Vol. 22, p. 691]. The operative mortality in Egyptian splenomegaly of schistosomal origin is 10–16 per cent. Of 6 cases of mycotic splenomegaly submitted to operation by the authors, 3 have recovered; 2 of these are relatively recent. They go on to indications and contra-indications for the operation and the preparation of the patient, for which the original must be consulted.

A. G. B.

NANTA (A.). L'iode dans le traitement des splénomégalies. [**Iodine in the Treatment of Splenomegaly.**]—*Presse Méd.* 1927. July 9. Vol. 35. No. 55. pp. 867–868. [2 refs.]

This author from Algiers, states, without giving details, that he has had good results from the administration of iodine in splenomegaly, whether malarial, syphilitic, or mycotic. The intravenous channel he finds the best.

A. G. B.

HITZROT (Lewis H.). **Coexisting Typhoid and Malaria. A Reconsideration, with Report of a Case.**—*Jl. Amer. Med. Assoc.* 1927. Aug. 20. Vol. 89. No. 8. pp. 596–598. [13 refs.] [Hosp., Univ. Pennsylvania.]

The conception of typhomalaria as a clinical entity is here attributed to WOODWARD, a Civil War army surgeon, in 1862, and the laying of the phantom, though it still haunts the minds of some physicians, to OSLER. The author discusses many records of the co-existence of the two diseases and among them that of H. H. SCOTT in Jamaica, who described 15 cases in which both diseases were diagnosed [see this *Bulletin*, Vol. 15, p. 252]. SCOTT was struck with the uniform mildness of the combined symptoms. The author notes that of 543 typhoid patients in a series in Philadelphia only two gave laboratory evidence of superimposed malaria. In the fresh case reported here the malaria appeared to be dominant, an unusual phenomenon. The temperature curve was that of double tertian ; cultures of *B. typhosus* were obtained from urine and faeces at the same time as plasmodia from the blood. The Widal reaction, negative on admission, was 8 and 12 days later strongly positive. This, and the rapid disappearance of the bacilli on treatment, leads the author to think that the patient was not merely a typhoid carrier.

" The course of the illness described was mild while under observation, the patient remaining afebrile after moderate quinine dosage. The facts, therefore, conform with the impression gained by others who have observed the double infection, that the course is apt to be milder than that of either disease alone."

A. G. B.

SNIJDERS (E. P.). Het typhoied-vraagstuk van tropische zijde bezien. [**The Tropical Aspect of the Typhoid Question.**]—*Nederl. Tijdschr. v. Geneesk.* 1927. Supplement to No. 15. Oct. 8. pp. 436–454. With 12 graphs. [19 refs.]

Generally speaking, typhoid fever is a frequent disease in the tropics. That the disease has long been endemic in the Dutch Indies is shown by WASZKLEWICZ's report in 1865.

In the army of the Dutch Indies typhoid fever in the period 1906–1916 was one of the principal causes of death with 10–25 per cent. of the total mortality, the mortality from this disease being greater than in the European armies, including the Russian, and approximating to that of the mortality of the British Army in India in 1905–1909 (15·8–31·9) and the French Army in Algiers in 1910 (14·2).

As regards the incidence of typhoid among Asiatics SCHUFFNER found that the typhoid mortality of Javanese and Chinese workmen of the Senembah Society for the period 1897–1904 was 30 per 10,000, for the period 1905–1912 14 per 10,000, and from 1913–1921 from

0 in 1915 to 22·7 in 1914. A similar high incidence of typhoid is found in the whole of East Coast. The influence of the climate itself must not be overestimated. The general hygienic state is of greater aetiological importance than the temperature, so that the typhoid incidence may be regarded as a gauge of the hygienic condition of a given district (disposal of sewage, water supply, isolation of infectious diseases and individual hygiene).

Next to typhoid paratyphoid A is the most frequent in the tropics. Salmonella infections (paratyphoid B, C, etc.) are much less frequent, contrary to what is found in North West Europe.

Investigations in British India, which have been confirmed elsewhere, have shown that the epidemiology of paratyphoid A is identical with that of typhoid, the source of infection being always a patient or a carrier.

J. D. Rolleston.

TRESTON (M. L.). **Enterica. Some Notes on the Value of Marris's Atropine Test in Diagnosis, and of T.A.B. Vaccine in Treatment. A Résumé of 151 Cases (1919-26).**—*Indian Med. Gaz.* 1926. Oct. Vol. 61. No. 10. pp. 477–479. [5 refs.]

The author notes that in addition to the clinical symptoms of typhoid fever other means of diagnosis should be employed if the diagnosis is to be confirmed at an early date. These are :—

1. Blood culture 1st to 5th day.
2. Widal's reaction 5th to 9th day or later.
3. Marris's atropine test.

The author describes the Marris test and consideres it to be of definite value [*v.* this *Bulletin*, Vol. 22, p. 392 (de CASTRO)]. As the result of experience he concludes that the T.A.B. vaccine in the treatment of enterica is of undoubted value. The vaccine may be given at any stage of the disease.

J. H. Tull Walsh.

DELANOË (P.). Au sujet du décès d'un jeune fonctionnaire causé par une fièvre typhoïde compliquée d'ictère franc. [**Case of Death from Enteric Fever with Jaundice.**]—*Bull. Soc. Path. Exot.* 1927. July 13. Vol. 20. No. 7. pp. 576–577. [1 ref.]

Calls attention to a second case of death in Morocco from enteric fever with jaundice and to the need for persons going to Morocco to be vaccinated against this infection.

A. G. B.

PAES (Augustine). **A Short Description of an Epidemic Disease of Children Prevalent in Goa since 1921.**—*Indian Med. Gaz.* 1927. Aug. Vol. 62. No. 8. pp. 428–430.

This epidemic, in children under six years, is one in which continuous vomiting, convulsions followed by muscular flaccidity, anaesthesia, coma, tympanites are prominent in severe cases with a 30 per cent. fatality ; benign cases are also described and fulminant, in which death occurs in a few hours. It affects chiefly Christian children. In two post-mortems a Government Commission found the diplococcus

of cerebrospinal meningitis in the C.S.F., but no typical symptoms of this were seen by the author and the course was always afebrile. Anti-meningococcus serum was administered without benefit.

A. G. B.

Bablet (J.) & Mesnard (J.). Syndrome rabiforme dans un cas de typhus exanthématique chez l'Annamite. [**A Case of Typhus in an Annamite suggesting Rabies.**]—*Bull. Soc. Path. Exot.* 1927. Apr. 13. Vol. 20. No. 4. pp. 318–320. [2 refs.]

A woman, aged 20, was bitten by a dog suspected of rabies on September 9th, and was admitted to hospital. The next morning she was violent and had to be controlled, temperature 38°, some difficulty in swallowing water ; there was history of a bite some months before. September 11th, T. 38·5° ; incessant contractions of the masseters ; dysphagia less marked. September 12th and 13th, T. 39·5° to 40° ; spasmodic contraction of the face muscles. September 14th, T. above 40° ; spasms continued. September 15th, improvement, temperature falling completely by 20th, and the mental state becoming normal the next day. The Weil-Felix reaction was tested on the 14th, and found to be positive, 1-300, and again on the 19th. This was a sporadic case of typhus, occuring in the dry season.

Cases with similar symptoms were reported by Cantacuzene in the Rumanian epidemic [this *Bulletin*, Vol. 17, p. 412].

A. G. B.

Banerji (R. N.). **A Case of Typhus Fever in Allahabad.**—*Indian Med. Gaz.* 1927. Aug. Vol. 62. No. 8. p. 452.

The patient had symptoms corresponding with those of typhus, which is a rare disease at Allahabad. No serological test was applied. No ticks or lice were seen on his body. No other cases were seen or reported.

A. G. B.

Alden (H. S.). **Cholelithiasis and Cholecystitis in the Negro.**—*Southern Med. Jl.* 1927. Nov. Vol. 20. No. 11. pp. 828–829. [7 refs.] [Emory Univ. School of Med., & Emory Division of Grady Hosp., Atlanta, Ga.]

The author quotes statistics of the incidence of cholelithiasis and cholecystitis in the negro of the U.S.A. which, he says, are surprisingly scanty but show that these conditions are much less frequent than in whites. In five years in Atlanta, Georgia, among 23,016 coloured admissions to the hospital wards, 39 cases of cholelithiasis or cholecystitis were diagnosed, of which 9 were proved to be one, and 9 the other condition. This brings the percentage of gallstones to the low figure of 0.039, that of cholecystitis being given as 0·13 per cent. [the discrepancy is not explained]. In the same period there have been 696 autopsies with two cases of gallstones, or 0·3 per cent., and no record of cholelithiasis. The author discusses this racial rarity, the cause of which is obscure. He suggests that " as civilization leads the negro into physical lethargy and a sedentary life, he will become more and more a victim of gastro-intestinal diseases, and will more easily acquire cholecystitis and cholelithiasis."

A. G. B.

THEODORE (J. H.). **A Preliminary Note on the Treatment of Small-pox by Intravenous Administration of Potassium Permanganate.**—*Indian Med. Gaz.* 1927. Sept. Vol. 62. No. 9. pp. 508–510. [2 refs.]

The author writes that of all the remedies used to prevent pitting and scar formation in smallpox potassium permanganate, locally applied, is said to be the most valuable. GORDON has shown by *in vitro* experiments that a dilution of 1 : 100,000 is sufficient to destroy vaccinia virus. With the idea that intravenous injection of the drug might abort smallpox the author carried out experiments at first on rabbits and then on man.

Rabbits were found to stand an injection of 10 cc. of a 1 : 500 dilution on three consecutive days, without ill effects, nor did the same dose disturb the author. Experiments were then made on rabbits vaccinated with calf lymph and treated 20 hours later with pot. permang. intravenously. The results tended to show that the drug had an abortive effect on vaccination. Three cases of smallpox (rash discrete) were then treated with a single dose of 1 : 500 dilution, with results sufficiently encouraging to warrant further trial. It is noted that a higher dose would probably be tolerated.

A. G. B.

ROELFSMA (H. L.). Het zenuwlijden der blanken in de tropen. [**Nerve Affections of Whites in the Tropics.**]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1927. Vol. 67. No. 5. pp. 658–666.

The author refers to the article of VAN LOON on the same subject (see this *Bulletin*, Vol. 24, p. 824). As a rhinologist it struck him that the picture which VAN LOON gives of the tropical neurosis shows a close similarity to the reflex neurosis brought about by intranasal affections. He quotes a few instances in which a neurosis was cured by adequate intranasal treatment. Generally speaking, he thinks that tropical neurosis is nothing but an increased irritability of the reflex mechanism. Affections of various organs may give rise in this way to untoward symptoms and special emphasis is laid in this respect on the prevalence of nasal affections in the tropics. The author gives a rather simplistic explanation of the various nervous symptoms, e.g., the hyperhidrosis of the neurotic is a sequel of his stopped nose, as the dry throat causes him to drink much, etc. Some reservation as to his conception of tropical neurosis appears justified.

W. J. Bais.

BASU (P. N.). **Some Observations on Cases of Anaemia amongst Troops in Bombay.**—*Indian Jl. Med. Res.* 1927. July. Vol. 15. No. 1. pp. 107–116. [4 refs.]

This illness is mainly confined to Hindus who adopt a dietary deficient in animal protein. Almost all cases investigated gave a history of diarrhoea closely simulating sprue, while in others there was dyspepsia. The total number of cases was 16, of which 14 were in

Indians and 2 in Europeans, one of whom had symptoms of sprue. Amongst the various methods of ascertaining the cause of the anaemia were the following :—

(a) Examination of gastric contents for free hydrochloric acid by fractional tests.
(b) Examination of faeces for total and split fats.
(c) The diastatic reaction of the urine.
(d) Examination of blood for the haemolytic point, calcium content, for presence of bilirubin and estimation of lipoids.
(e) Bacteriological examination of faeces.
(f) Experimental administration of certain intestinal haemolytic streptococci and other non-lactose fermenting organisms.
(g) Experimental treatment of patients by autogenous vaccine and blood forming drugs.

The results showed that in almost all cases of anaemia there is a deficiency of hydrochloric acid in the gastric juice ; that of healthy Indians is below the European standard. The estimation of neutral fat and free fatty acid in the faeces showed that whereas in 40 healthy individuals the rate was 1 : 2·9, in anaemic conditions it was as high as 1 : 8·8, which is mainly due to the action of intestinal bacteria. The excretion of total fat was not high, thus differing from sprue where fats form more than 40 per cent. of the total weight of dried faeces. As regards the blood, none of the anaemia cases showed marked regeneration types of red cells, thus showing an aplastic anaemia. The Van den Bergh test gave a positive indirect reaction with slight increase of bilirubin content in comparison with that of healthy Indians. The calcium content of 12 healthy individuals (Indians) gave an average of 7·5 mgm. per 100 cc., the average of the 16 anaemias 6·8–7 mgm. per 100 cc. Estimation of blood lipase (Lowenhart's method) showed a deficiency of absorption fats in almost all cases.

Bacteriological examination of the stool revealed the presence of a large number of putrefactive and fermentative organisms virulent in type.

No improvement in suspected sprue was noted after administration of calcium and parathyroid extract. In three cases blood transfusion of 8 ounces of blood was carried out on two occasions. One European case improved very much, but in the other two, Indian, cases the improvement was not maintained.

P. H. Manson-Bahr.

Campbell (G. J.) & Patel (G. P.). **Some Observations on Appendicitis among Indian Women.**—*Indian Med. Gaz.* 1927. Aug. Vol. 62. No. 8. pp. 437–438.

Twenty-five appendices removed with aseptic precautions from Indian women at Delhi by the senior author were examined microscopically and bacteriologically. Fourteen showed from one to seven threadworms each. Twenty-three contained faecal matter. Cultures gave a growth of *B. coli*. All the patients had been admitted for gynaecological complaints. The authors ask : What is the cause of the reflux of faecal contents into the appendix ; is the presence of Oxyuris a result of this reflux ; what is the normal incidence in Indian women of this worm ?

[Spriggs records the results of examination by X-rays of 300 appendices. He concludes that the normal appendix fills and empties about

the same time as the caecum. Photographs are given of 12 normal appendices in all of which more or less of the barium is visible (*Lancet.* 1919, Jan. 18. p. 91).]

A. G. B.

GRACE (A. W.). **A Case of Uraemia.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1927. Aug. 31. Vol. 21. No. 2. pp. 151–152.

Case observed in a negro in British Guiana. It was of interest on account of the apparently localized cerebral disturbance in the fit, high blood urea and inorganic phosphate, and the occurrence of large white kidneys at autopsy—a rather uncommon finding in British Guiana.

A. G. B.

LICHTENSTEIN (A.). Over temporaire Urobilinurie. [**Transitory Urobilinuria.**]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1927. Vol. 67. No. 6. pp. 899–906. [6 refs.]

The author summarizes the conclusions from his experiments as follows :—

1. Some people show a physiological urobilinuria, depending on the taking of food and its quantity.

2. The presence of urobilin in a specimen of urine voided in the afternoon or in the evening has not necessarily a pathological significance. Such may be attached, however, to the same finding in the morning hours, generally speaking before noon.

(3) Injection of 100 cc. haemolysed own blood may produce urobilinuria.

(4) The normal liver does not always constitute an absolutely tight barrier against the passing of urobilin into the blood. (Experiments in which urobilin appeared promptly in the urine after emptying of the gall bladder by means of a pituitrin injection.) Probably, however, the absorption of urobilin from the colon through the venae haemorrhoidales plays a part in the causation of the physiological urobilinuria.

W. J. Bais.

JUNGEBLUT (Claus W.). Ueber die Beziehungen zwischen retikuloendothelialem System und chemotherapeutischer Wirkung. [**Relations between the Reticulo-endothelial System and Chemotherapeutic Action.**]—*Ztschr. f. Hyg. u. Infektionskr.* 1927. Apr. 29. Vol. 107. No. 2. pp. 357–379. [33 refs.]

FELDT (Adolf) & SCHOTT (Alix). Die Rolle des Retikuloendothels beim chemotherapeutischen Heilungsvorgange. [**The Role of the R.E. in Chemotherapeutic Curative Processes.**]—*Ibid.* pp. 453–471. [13 refs.]

These two papers, the one from the Frankfurt and the other from the Koch Institute, are concerned with essentially similar problems and the conclusions to which the authors arrive are practically identical. Much attention has been given in recent years to the part played by the reticulo-endothelial system in immunological phenomena, particularly in the fields of natural immunity and antibody-response to antigen. By blockading the reticulo-endothelial system (repeated parenteral injection of substances like indian ink and various dyes) and by removal of spleen or preferably by both of these procedures, it has been possible to reveal differences in response to antigen injection, degree of immunity, etc. The particular problem studied by Jungeblut

and Feldt and Schott was the influence of chemotherapeutic substances on spirochaete and trypanosome infections in animals previously prepared by blockade or splenectomy or both. It was thought that light might be thrown on the modification presumed to take place in chemotherapeutic substances after injection into the body, which would explain their comparative lack of action *in vitro*. The experimental infections were brought about in mice with *S. recurrentis* and *T. brucei* and the substances tested were neosilbersalvarsan and "Bayer 205." The paper contains numerous tables of experimental results. The conclusion is reached that (1) recurrens infection in blockaded mice runs a far severer course than in normal mice, (2) that doses of neosilbersalvarsan which in 100 per cent. of cases would sterilize the controls are by no means sufficient in blockaded and splenectomized animals, and (3) that the full action of chemotherapeutic substances in these protozoan infections of mice appears to depend on the intactness of the reticulo-endothelial system, the suggestion being that the change in these substances from the inactive form *in vitro* to the active *in vivo* takes place through the intermediary of the reticulo-endothelial system.

Feldt and Schott's communication is equally well documented. Recurrens and nagana infections in mice were also the test infections, and various chemotherapeutic substances were employed, such as salvarsan, solganal, trypaflavin, "Bayer 205," etc. They conclude that the reticulo-endothelial system has other functions than those of antibody-production and phagocytosis and that on its intactness depends the therapeutic action of the chemical substances in question.

These two papers contain valuable summaries of relevant literature.

J. C. G. Ledingham.

Kritschewski (I. L.) & Rubinstein (P. L.). Ueber die Natur der Immunität beim Rückfallfieber. I. Der Einfluss des retikulo-endothelialen Apparates auf den Verlauf des Rückfallfiebers. [**Immunity in R.F. Influence of the R.E. System on the Course of R.F.**]—*Ztschr. f. Immunitätsf. u. Experim. Therap.* 1927. May 18. Vol. 51. No. 1-2. pp. 27–56. With 3 diagrams in text. [Refs. in footnotes.]

Lisgunova (A. W.) & Butjagina (A. P.). Ueber die Natur der Immunität beim Rückfallfieber. II. Das retikulo-endotheliale System der Ratten beim Rückfallfieber.—*Ibid.* pp. 56–64. With 1 diagram in text. [4 refs.]

These two papers from the Moscow Microbiological Institute contain the results of further experimental work by Kritschewski, the Director, and various collaborators in connexion with the R.-E. system. The chief object was to ascertain what part the spleen played in recurrens infection—a problem often studied in the past but hitherto not fully elucidated. The results obtained from mice experimentally infected at various periods after splenectomy, blockade or both procedures, seem remarkably uniform, and appear to show conclusively that removal of the spleen influences very markedly the mortality from recurrens subsequently injected. The percentage of animals which succumb to infection with spirochaetes induced 24 hours after splenectomy was 74·08, 48 hours after splenectomy, 88·89, three days after,

86·45, four days after, 59·26, and seven days after, 15·0. Mice infected after simple laparotomy gave a mortality of 4·25, while mice not operated upon gave a mortality of only 3·82 per cent.

It is thus seen that compensatory mechanisms for loss of spleen substance are soon set in motion. Simple blockade of the R.-E. system was accompanied by a mortality to subsequent infection of only 46·15 per cent. whereas combined splenectomy and blockade had a mortality to subsequent infection of 90·47 per cent. It is clear, therefore, that in chemotherapeutic experiments on blockaded or splenectomized animals, account has to be taken of the very different course of the infection produced by such interferences alone. The maximal effect of a chemotherapeutic substance would depend on some balance between two factors, the nature and dose of the substance and the resistance of the body to the particular infection employed—a resistance which would be determined by the condition of the R.-E. system generally and the spleen in particular. The results in the authors' view are in complete accord with those of METCHNIKOFF on the importance of the spleen in recurrent fever immunology.

J. C. G. Ledingham.

KRITSCHEWSKI (J. L.). Das retikulo-endotheliale System und Chemotherapie. [**The Reticulo-endothelial System and Chemotherapy.**] —*Cent. f. Bakt.* I. Abt. Orig. 1927. Vol. 104. No. 1-4. pp. 214–218. [10 refs.]

In previous abstracts of the work of this author and his collaborators reference has been made to the importance of the integrity of the reticulo-endothelial system for the effective action of chemotherapeutic substances. In the case of relapsing fever a solution of the problem of the mechanism involved is complicated by the fact that the natural defence against experimental infection with the spirochaete is believed to reside in the R.-E. system. The present paper, which was delivered at a meeting of the *Deutsche Vereinigung für Mikrobiologie* at Vienna in June, 1927, deals with experimental trypanosome infection where the R.-E. system does not apparently constitute a natural defence system. Here Kritschewski recognized the necessity of studying the mechanism of the chemotheraputic effect when the drug was administered "prophylactically," i.e., at a time when the parasites have not yet appeared in the blood and by their dissolution stimulated the antibody-forming tissues, thus complicating the evaluation of the drug effect. A series of representative derivatives was used, trypanred, pyronin, trypanosan, atoxyl, neosalvarsan, tartrate of antimony, trypaflavin and germanin. The results of the experiments, protocols of which are to be published elsewhere (in *Zeitschr. f. Immunitätsf.*) showed that splenectomy greatly diminished the efficiency of all these substances without exception. Germanin, for example, not only loses its sterilizing action, but in 40 per cent. of trials may be rendered as inactive as distilled water. He argued, therefore, that the action of the R.-E. system as a defence mechanism cannot be correlated with its capacity to determine the efficiency of a chemotherapeutic remedy. The author now attempts to get nearer to the actual mechanism. He believes that splenectomy and blockade prevent the incorporation and possible elaboration of the drug by the R.-E. cells—an essential preliminary, he conceives, to the drug's therapeutic action. If not incorporated and elaborated by the R.-E.

cells, it is liable to be excreted rapidly from the body. Thus, in his view, a tropism of the drug for the cells of the body does not exclude, as Ehrlich thought, a tropism for the parasite. The former is, in fact, necessary for the due performance of the latter.

In the discussion which followed the paper, caution was advised in interpreting the results of splenectomy and blockade experiments. Kolle adhered to the view of Ehrlich that organotropism is merely a measure of toxicity of drug and is not indispensable for its parasitotropism.

J. C. G. Ledingham.

Kritschewski (I.). Ueber eine bisher noch unbekannte Funktion des retikulo-endothelialen Systems. I. Die Beziehungen der Chemotherapie und Chemoprophylaxe zum retikulo-endothelialen Apparat. [**A Hitherto Undescribed Function of the Reticulo-Endothelial System. I. Its Relation to Chemotherapy and Chemoprophylaxis.**]—*Ztschr. f. Immunitätsf. u. Experim. Therap.* 1927. Dec. 5. Vol. 53. No. 5-6. pp. 506–531. [8 refs.] [Education Commissariat R.S.F.S.R., Moscow.]

This paper contains the full protocols on which the author based the conclusions formulated in the previous paper. There are twenty tables displaying the results with a variety of drugs in experimental trypanosome infection and their careful study is recommended to all interested in the role of the reticulo-endothelial system in determining the efficacy of a chemotherapeutic substance.

J. C. G. Ledingham.

i. Schwetz (J.). Introduction à l'étude des médicaments indigènes (plantes médicinales) du Congo Belge. [**Introduction to the Study of Native Medicines (Plants) of Belgian Congo.**]—*Ann. Soc. Belge de Méd. Trop.* 1927. Nov. Vol. 7. No. 2. pp. 185–198.

ii. Wattiez (N.). Introduction à l'étude chimique des médicaments coloniaux d'origine végétale.—*Ibid.* pp. 199–209.

i. After preliminary remarks which illustrate the difficulties of the study the author gives a list of 48 substances, chiefly the root bark of trees collected in the Katanga district, with the native name, a very short description of the plant and its native uses. In only two instances has the botanical determination been made. [In a third the plant is said to be *Berberis vulgaris*, but this is not indigenous to Africa.]

ii. The Professor of "Pharmacognosy" of Brussels University, to whom Dr. Schwetz's specimens were sent, remarks that for the chemical study of vegetable drugs one must have the material either fresh or stabilized in some way. In the process of desiccation, expecially when it is conducted without great care, the chemical composition changes. As a result of fermentation after gathering certain active principles, especially glucosides, tannins and even alkaloids may disappear entirely or at least be profoundly altered. The chemical composition must therefore be fixed by heat, either of boiling alcohol or water. The author describes a piece of apparatus which has been employed in his laboratory for some years for the chemical study of fresh plants. It is of copper with a capacity of 6 litres, carries a cylinder on its lid through which material is introduced, and is connected with a cooling apparatus to condense the vapour. Five litres of alcohol and 50 grams of calcium carbonate are introduced, the

latter to neutralize the acidity of the drugs and to reduce hydrolysis or oxidation to a minimum. When the alcohol is boiling the material is added. The chemical principles pass into the fluid, which is afterwards analysed. The author notes that the natives are well aware that a plant deteriorates in value in drying. Cola nut, for instance, must be eaten in the fresh state if it is to exercise its well-known effect. If it is impracticable to use alcohol water will do, calcium carbonate being added as before, 50 gm. to one kgm. of plant, and the boiling being prolonged for a quarter of an hour. The resulting fluid is concentrated to a small volume and introduced into the receptacle to be used for its transport with sufficient toluol to prevent bacterial action.

If no means of sterilization can be employed, the plant must be washed immediately after collection to free it of earthy particles, dried rapidly in the shade or in a well ventilated building, and placed in an airtight receptacle containing a dehydrating substance such as calcium chloride. Dr. Schwetz's specimens seem to have been dried without these precautions. Professor Wattiez adds notes on 16 of the specimens, mentioning which of them seem worth further study and indicating the presence of alkaloids where they were found, since alkaloids resist fermentation better than other active principles. Histological study may sometimes give indication of the botanical origin. Stas's method was used for research of alkaloids.

A. G. B.

Hall (Ivan C.) & Whitehead (Richard W.). **A Pharmaco-Bacteriologic Study of African Poisoned Arrows.**—*Jl. Infect. Dis.* 1927. July. Vol. 41. No. 1. pp. 51–69. With 2 text figs. [31 refs.] [Univ. of Colorado Med. School, Denver.]

The following extract from the author's summary gives an adequate account of this paper :—

" Attention is again called to the general recognition that wounds by arrows, poisoned or otherwise, are likely to be infected wounds."

" The present study deals with six African bushman arrows obtained by Dr. C. E. Cadle during the Denver African Expedition of 1925 from the Kalahari, Ovachimba and Heikum tribes. The probably complex nature of the poison is suggested. Only the Heikum arrows had poison upon them. There was no evidence of alkaloidal poisons. The poison was separated into amorphous and crystalline fractions, the former about one-half as toxic as the latter. The crystalline fraction was fatally toxic for frogs in doses of 0·00039 to 0·00044 mg. per gram weight of frog. Both fractions behaved alike, killing guinea-pigs, cats and frogs by stopping the heart in marked ventricular systole. The poisons could not be identified with any known drugs, but resembled the glucoside ouabain in some respects. Two kinds of crystals were noted but the small amount available precluded separation.

" All of the arrows, except the smaller Heikum arrow, had pathogenic bacilli upon their points in addition to the non-pathogenic " hay bacilli " ; the obligate anaerobes (*B. centrosporogenes*, *B. bifermentans*, *B. sporogenes*, *B. nonfermentans* n. sp., B. *subterminalis* n. sp.) and the aerobes (*Staphylococcus albus*, *Streptococcus fecalis*, and *Streptococcus mitis*) occurred as indicated. The pathogens were *B. histolyticus*, *B. Novyi*, *B. septicus*, and *B. Welchii*. All of the infected arrows had *B. histolyticus* on them."

The authors note with surprise that neither *B. tetani* nor *B. botulinus* were found seeing the well-known frequency of these forms in the soil.

A. G. B.

Caius (J. F.) & Mhaskar (K. S.). **A Study of Indian Medicinal Plants. *Holarrhena antidysenterica*, Wall.**—*Indian Med. Res. Memoirs* (*Supplementary Series to Indian Jl. Med. Res.*). 1927. May. Memoir No. 6. 61 pp. With 7 plates, 1 map, 2 figs. & 18 graphs. [39 refs.] [Haffkine Inst., Bombay.]

This complete and detailed study was undertaken because the use of this plant as a native medicine for diarrhoea is well established; both seeds and bark figure in a large number of prescriptions used by native doctors; indeed, some pages of the memoir are occupied by these prescriptions. The authors write that they are not quack remedies, but "true prescriptions formulated according to definite rules," so that an enquiry into the therapeutic value of the plant is well justified.

The plant, which is known as Conessi bark tree and, in Bengali, as Kurchi, is a shrub or small deciduous tree of N.O. *Apocynaceae*; its botanical characters are fully described; a key to those which distinguish it from three other plants is given. *H. antidysenterica* is widely distributed in India and Burma. Its seeds, the oil therefrom, the bark, the gum, are taken up in turn. The seeds were found to contain 29·3 per cent. of fixed oil, and 0·025 per cent. of alkaloid. Of 49 cases of amoebic dysentery treated 28 improved, of 50 cases of non-amoebic dysentery 16 improved and of 28 suffering from diarrhoea of different types 17 improved. The study of the oil and its clinical trial led to the conclusion that it had no marked advantage over the powdered seeds.

The bark constitutes the principal medicine for dysentery in the Indian Pharmacopeia. The powdered bark was here dispensed in daily doses of 60 grains in three or four portions. Of 67 cases of amoebic dysentery so treated, 51 improved; of 55 cases of non-amoebic dysentery 37 improved and of 20 diarrhoea cases, 9 improved; i.e., in dysentery satisfactory results were obtained in 67 to 76 per cent. of cases. Chemical study of the bark showed the presence of 9·5 per cent. gum and 0·22 per cent. alkaloid. The gum was studied and its clinical test in a smaller number of cases gave similar results to those of the bark.

A study of the alkaloid follows; it was first isolated as nereine in 1858 and was called conessine in 1865. Colour reactions and microchemical tests are recorded. In toxic doses conessine paralyses the respiratory centre, weakens the heart and acts as a true vaso-constrictor. Two amoebic cases that were treated improved [which hardly seem to justify the summary statement—conessine appears to be effective in the treatment of amoebic dysentery]. The authors note that the ordinary methods of plant analysis have failed to detect the principle or principles responsible for the antidysenteric properties of *Holarrhena antidysenterica*; it is neither anthelmintic, nor stimulant, nor astringent, nor styptic.

They give at the end of the memoir a table illustrating the antidysenteric and antidiarrhoeal efficacy of the various parts of the plant used. The time taken to return to normal conditions of health averaged 12 days in the case of the seeds and 9 in that of the bark or gum. They recommend as a safe and reliable treatment of diarrhoea the daily administration of 60-120 grains of powdered bark in 3-4 portions. A useful list of references concludes the memoir.

A. G. B.

CHOPRA (R. N.), GUPTA (J. C.), DAVID (J. C.) & GHOSH (S.). **Observations on the Pharmacological Action of Conessine, the Alkaloid of** *Holarrhena Anti-Dysenterica.—Indian Med. Gaz.* 1927. Mar. Vol. 62. No. 3. pp. 132–140. With 5 graphs. [7 refs.]

Holarrhena antidysenterica is a small deciduous tree of the N.O. *Apocynaceae*. It is a native of the tropical Himalayas going up to 3,500 feet, and is found through the dry forests of India as far south as Travancore; it is often confused with *Wrightia tinctoria*. The root-bark has been tried "somewhat extensively" in the treatment of amoebic dysentery. Conessine was isolated as long ago as 1858. Recently H. C. BROWN and HENRY and BROWN have studied its action [this *Bulletin*, Vol. 19, p. 690; Vol. 20, p. 782]. The conclusions of the careful investigations of the authors are as follows:—

"1. Conessine has a specific action on *E. histolytica* obtained from the stools of infected kittens. It kills these organisms in mucus flakes in dilutions of 1 in 280,000 in 8 minutes in the presence of an alkali and in 18 minutes in the absence of alkali. Emetine under similar conditions kills *E. histolytica* in dilutions of 1 in 200,000, but in the absence of alkali such dilutions have no effect on this entozoon. In view of these findings it is concluded that this alkaloid may prove to be of great use in the treatment of amoebic dysentery.

"2. In the case of intestinal protozoal flagellates such as *Trichomonas hominis*, conessine had little toxic effect, though on free-living flagellates such as *Bodo*, its effect was as marked as on *E. histolytica*.

"3. Conessine salts (hydrochloride, hydrobromide and tartrate) can be given subcutaneously and intramuscularly. One to six per cent. solutions of such salts produce only slight local effects. No necrosis of tissues was observed.

"4. The alkaloid has an inhibiting action on the activity of the digestive ferments, such as ptyalin, pepsin, and trypsin.

"5. Conessine salts when given intravenously possess a marked depressing action on the tissue of the auriculoventricular bundle and in large doses produce irregularity, incoordination, increase of diastolic pause and heart block. Even small doses given in this manner to cats produced a marked and persistent fall of blood pressure after a preliminary transient rise. These effects were not noticed when the drug was given intramuscularly or subcutaneously, and experiments show that in dilutions of 1 in 120,000 such as would be expected to occur in the blood, it has no effect on the isolated mammalian heart. The drug could therefore be administered by these routes for therapeutic purposes, but its intravenous administration is not recommended.

"6. The alkaloid has no marked effect on the central nervous system of mammals."

A. G. B.

WINTON (F. R.). **The Rat-Poisoning Substance in Red Squills.**—*Jl. Pharm. & Experim. Therap.* 1927. June. Vol. 31. No. 2. pp. 123–136. With 1 fig. [4 refs.] [Dept. Pharmacol., Univ. Coll., London.]

The author has shown that the substances in squill extracts responsible respectively for their actions on the heart and for poisoning rats are different. The latter occurs in appreciable quantity in red squill (*Urginea maritima*) but not in white squill. Red squill preparations administered per os to rats induce convulsions and paralysis. There is no diarrhoea and "an action on the circulation adds no

significant contribution to the fatal result." Female rats succumb to doses of red squills only half as great as those needed to kill males, a circumstance which favours the use of this poison in the destruction of these pests. Abnormal previous diets and administration of previous sublethal doses have little influence on susceptibility. The average lethal dose of a red squill powder may be 50 per cent larger if it is less finely subdivided. The rat-poisoning substance is relatively thermostable, is soluble in water and in concentrations of alcohol and acetone up to 90 per cent., and is destroyed by boiling with dilute acid or alkali. It can be kept for long periods without deterioration; e.g., a sample of squill powder used for 5 years as a museum specimen was still fully active.

A. G. B.

Watt (J. M.) & Brandwijk (Marie G.). **Poisoning by *Jatropha curcas*, L. (Physic Nut Tree or Purging Nut Tree).**—*Jl. Med. Assoc. S. Africa.* 1927. July 23. Vol. 1. No. 14. p. 370. [9 refs.]

An account from a Pharmacological Laboratory of the plant, its habit and habitat, its uses, and the symptoms of poisoning. A South American shrub, it is naturalized in Africa and South East Asia. The oil, expressed from the seeds, has an action similar to croton oil. It contains two irritant substances, an acid of the crotonoleic type and a toxalbumin, curcin. Since symptoms are slow in developing, the best treatment, whether or no symptoms have appeared, is to wash out the stomach.

A. G. B.

Chopra (R. N.). **An Experimental Investigation into the Action of Organic Compounds of Antimony.**—*Indian Jl. Med. Res.* 1927. July. Vol. 15. No. 1. pp. 41–48. With 6 graphs. [6 refs.] [Calcutta School of Trop. Med. & Hyg.].

This paper gives an account of the results obtained in a series of experiments designed to ascertain the mode of action of some of the derivatives of *p*-aminophenylstibinic acid now being used in India for the treatment of kala azar. Cats, weighing 2 to 2·5 kgm. were used, with urethane intramuscularly as an anaesthetic, supplemented by ether when necessary. The drugs were injected into the femoral vein in doses of 10 to 100 mgm. in 4 per cent. solution. Doses of 50 mgm. gave marked reactions, while with 100 mgm. the symptoms amounted to toxic effect.

The drugs all produced a fall in systemic blood pressure, due probably to lessened output of the left ventricle and to dilatation of vessels in the splanchnic area; there is a corresponding rise in pulmonary pressure. It is to these effects, and those on the respiration referred to below, that the more severe toxic symptoms, which occasionally follow injections of antimonial drugs, are attributed. These symptoms resemble the "nitritoid crises" resulting from the injection of organic arsenical drugs and for which four causative factors have been suggested, (a) effect of the drug on the pulmonary arterioles causing contraction, (b) excessive alkalinity of the solution causing irritation of the endocardium, (c) constriction of the bronchi, (d) pulmonary vascular constriction due to precipitation of the drug; (a) and (c) are regarded as operative also in the case of antimony compounds and

(d) is under investigation, but as regards (b), the antimony solutions are acid (pH 4 to 7) and the effect is least marked in the most acid, tartar emetic, so that the acidity (or alkalinity) factor is believed to be of little moment.

The limb volume shows a slight fall and the intestinal volume a slight fall, followed by a slight rise. Peristaltic movement increases and becomes irregular. There is a well-marked decrease in the volume of the kidney and rhythmic contractions become more apparent.

Even a dose of 50 mgm., which produces little effect on the blood pressure, causes a well-marked dilatation of the spleen and the liver. These effects, which are shown less by tartar-emetic, are believed to be of importance in connexion with the superior curative value of the organic antimonials, since they are thought to be due to the engorgement of these organs with blood carrying the drug.

Little or no effect is produced on respiration except when large doses are given. The respiration stops immediately the blood pressure falls and afterwards is jerky and irregular and the breathing changes from abdominal to intercostal and finally thoracic. These changes are attributed to (1) depression of the respiratory centre, (2) rise in pulmonary pressure, and (3) contraction of the bronchial muscles.

T. A. Henry.

Hodgson (E. C.), Vardon (A. C.) & Singh (Zorawar). **Studies of the Effects of Antimony Salts. No. 1. The Effect of Antimony Salts on Conception and Pregnancy in Animals.**—*Indian Jl. Med. Res.* 1927. Oct. Vol. 15. No. 2. pp. 491–495.

The authors state that over 60,000 patients were treated for kala azar with antimony salts in 1925–6 in Assam, and over 100,000 in Bengal, and that there is an impression among patients and their friends that these salts cause sterility or abortion. They therefore experimented on rabbits and white mice with sodium antimony tartrate, which is chiefly used in India because it is cheap, and two unnamed organic salts, one of which is non-irritant when injected under the skin. The mice were used in batches of 10 females and 2 males, and the results for each species are tabulated with details of the number of young born. Adequate controls were employed. The authors recognize that the number of experiments was small and the time, 3 months, short, but they reach the conclusions that salts of antimony cause damage to female animals while receiving periodic injections, the damage showing itself in either failure of conception, abortion or damage to the foetus, that the injury appears to pass off rapidly when injections are discontinued, and that evidence is wanting of any effect in causing sterility in males. Clearly, further investigation is called for.

A. G. B.

Roy (Nagendra Nath). **Conjunctival Congestion after Urea-Stibamine Injection.**—*Indian Med. Gaz.* 1928. Jan. Vol. 63. No. 1. pp. 17–18.

The author notes that in a patient receiving twice a week injections of urea-stibamine, 0·05 gm. to 0·20 gm., five minutes after each injection the conjunctivae became " extremely red and congested " for about two hours, the congestion being accompanied by fits of sneezing.

A. G. B.

La Terza. Alguns casos de accidentes com o treparsol. [**Toxic Effects of Treparsol.**]—*Brazil-Medico.* 1926. Dec. 11. Year 40. Vol. 2. No. 24. pp. 329–333. [3 refs.]

Four cases of much interest are here recorded, showing the risks of taking treparsol except under prescription and observation.

The first was a woman of 24 years who appears to have been very susceptible to the action of the drug. She took two pastilles of treparsol for eczema of the hands. The following day she was pallid, with a pulse-rate of 110, temperature 36·2° C., icteric discoloration of the sclerotics, epigastric pain and slight palpitation. Recovery was rapid after administration of adrenalin and cardiac tonics.

The second was a boy, 10 years of age; he was given two pastilles of treparsol on each of the first three days of August; on the 18th to the 21st one each morning and evening. After a further interval of ten days he took two daily for 23 days. Thirty-six hours later he complained of headache and giddiness; convulsions of an epileptiform character supervened with persistent coma; the urine contained albumin and hyaline and granular casts. Cerebrospinal fluid was withdrawn and revealed abundant albumin, and gave a positive Wassermann reaction. Death occurred the same day.

The third case was a man of 21 years, who, after 24 injections of thiosol, was given two tablets of treparsol daily for three days, to be repeated after an interval of three more days. At the beginning of the second series he complained of headache and pain in the stomach, but nevertheless took the second dose of two tablets. The symptoms became aggravated and there was bilious vomiting, mental hebetude, slight trismus and some indications of meningitis, rigidity of the neck and Kernig's sign. The cerebrospinal fluid was clear, but highly albuminous. Death took place seven hours later.

The fourth was a dentist, aged 28 years, suffering from a chronic pharyngitis. Treatment by 914 was suggested but refused, and treparsol was substituted. He took three pastilles on each of three successive days, though he experienced chilly sensations after the second day. In the afternoon of the third day he was attacked with vertigo, bilious vomiting and diarrhoea, succeeded by weakness of the legs and pain in the calves. He improved sufficiently to return to work in a month. Some three weeks later he began to suffer from dyspepsia and jaundice, which became worse and was accompanied by bilious vomiting, sometimes with blood. The gums bled readily, the faeces were grey in colour, and the urine bile-stained. Under treatment he slowly recovered, but not for fully three months from the onset.

The author ascribes the condition to a state of "colloidoclasic shock," a kind of anaphylaxis due to idiosyncrasy to the arsenical group of drugs.

H. Harold Scott.

Bender (William L.). **Stovarsol (Spirocid) Poisoning. Report of Six Cases.**—*Amer. Jl. Med. Sci.* 1927. Dec. Vol. 174. No. 6. pp. 819–833. [23 refs.] [Univ. of California Med. School, San Francisco, Calif.]

This drug was synthesized by Ehrlich in 1909, tested therapeutically and discarded on account of its toxic properties and weak effect in syphilis; it was re-examined in 1921 by Trefouel, who believed its failure to be due to impurities: in 1922 it was introduced by Levaditi for the treatment of syphilis. It contains 27 per cent. arsenic. It is used in amoebiasis and yaws as well as other infections. The author describes all the undesirable effects which he has been able to find in

published papers and reports fully 6 cases of his own. In these the findings were, *Endameba councilmania* (3 cases), Giardia, *E. histolytica*, supposed amoebiasis (1 case each).

Conclusions.—" Stovarsol (spirocid) . . . produces undesirable symptoms with considerable frequency ; although a variety of manifestations have been reported, there are certain outstanding signs such as fever, skin eruption and adenitis which appear quite constantly as a syndrome characteristic of stovarsol poisoning. Though reactions are usually mild, some exceptionally severe ones have been reported, including exfoliative dermatitis and one fatality.

" While individual idiosyncrasy is the most important cause of ill effects from the drug, the consideration of lesser factors such as selection of cases for its use and the dosage is important. The acquaintance with and recognition of the early toxic symptoms is essential in prescribing stovarsol since in most instances prompt discontinuation is all that is necessary to avoid serious poisoning."

A. G. B.

Chopra (R. N.) & David (J. C.). **The Pharmacological Action of Quinamine.**—*Indian Jl. Med. Res.* 1927. Oct. Vol. 15. No. 2. pp. 343–348. With 3 graphs. [5 refs.] [School Trop. Med., Calcutta.]

Quinamine is an alkaloid found in small quantities in the bark of several species of Cinchona produced in India. Its action has not hitherto been investigated. It was lethal to *Paramecium caudatum* at pH 7·8 in 30 minutes in 1 : 6,000 dilution, and in this respect is less toxic than the other alkaloids of cinchona bark except cinchonine. It has such a pronounced effect on the uterus of cat and guineapig that the authors are disposed to make it responsible for the oxytocic property attributed to quinine.

A. G. B.

Hughes (T. A.) & Shrivastava (D. L.). **Effect of Quinine on Phosphorus Metabolism in Man.**—*Indian Jl. Med. Res.* 1927. Jan. Vol. 14. No. 3. pp. 601–617. [29 refs.]

Quinine in anti-malarial doses in man causes a retention of phosphates. In the light of researches by themselves and others, the authors consider it evident that the drug interferes with carbohydrate metabolism. In the doses mentioned it causes a fall in the blood-sugar, probably owing to an increased output of insulin. Stimulation of the vagus nerve in cats, and injection of vagal stimulants in rabbits produces hypoglycaemia. This indicates that quinine stimulates the parasympathetic system. While the fall in blood-sugar after quinine administration can be prevented by the previous ingestion of carbohydrates, this does not prevent, but rather tends to augment the effect on the islets. When, therefore, quinine is given for long periods in large doses in the treatment of malaria, the prolonged stimulation of the pancreatic islets produces exhaustion of this tissue finally and thus the authors think it may play a rôle in the causation of a diabetic condition.

W. D. Halliburton.

Gray (George M.). **Notes on Three Cases of Idiosyncrasy to Quinine.** —*West African Med. Jl.* Lagos. 1927. Oct. Vol. 1. No. 2. pp. 28–29.

In the three cases described a dose of 4 or 5 grains of bisulphate or hydrochloride of quinine was followed by an erythematous rash all over the body, restlessness and oppression, increased pulse rate, dilated pupils (in 2 cases). In two of the patients the symptoms were so severe that the patients, who had just come to Nigeria, returned to Europe. Two attempts made to accustom one patient to quinine by beginning with small doses failed. " On the voyage [home] he went down with an attack of malaria. He was given quinine, the dose is unknown, died, and was buried at sea." [Quinine had been forced upon this patient in Nigeria with the result that he became so ill that his life was despaired of, so that the implication in the statement quoted seems justified.]

A. G. B.

Póvoa (Hélion). Syndrome quinino-anaphylactica. (Caso clinico.) [**Quinine Anaphylaxis.**]—*Brasil-Medico.* 1927. Feb. 19. Vol. 41. No. 8. pp. 155–157.

Instances of cutaneous rashes occurring during quinine administration and usually denominated susceptibility to the drug are ascribed to anaphylaxis. Mention is made of a man of 32 years who suffered from giant-urticaria while taking gramme doses of hydrochloride of quinine for an attack of influenza. Instead of suspending the use of the drug, the author treated the case by " desensitization," reducing the dose daily by 5 cgm. for ten successive days. Attacked afresh by influenza, the patient was given the full gramme dose, without ill effect.

H. Harold Scott.

Hoffmann (W. H.). Sobre la farmacologia del aceite de chaulmoogra. [**The Pharmacology of Chaulmoogra Oil.**]—*Sciencia Med.* 1927. July Vol. 5. No. 7. pp. 357–358. [Finlay Lab., Havana.]

The various preparations of chaulmoogra oil vary greatly in their efficacy. To which constituent the benefit is due is uncertain. It is suggested that the components and the relative proportions of these should be stated on the preparations in order that the question as to whether the relative efficacy accords with the degree of optical activity might be tested by practitioners.

H. Harold Scott.

Wolff (J. W.). De gevaren der tetrachloorkoolstof. [**The Dangers of Carbon Tetrachloride.**]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1927. Vol. 67. No. 2. pp. 254–276. With 13 figs. on 4 plates. [43 refs.]

Some controversy still exists in the current literature concerning the character of the toxicity of carbon tetrachloride. Whilst some authors ascribe this toxicity to very poisonous admixtures (Khalil, see this *Bulletin*, Vol. 23, p. 779) others suspect the drug as such. Some

brands apparently produced no toxic effects notwithstanding the presence of much impurity ; in other cases fatal intoxications occurred by carbon tetrachloride responding to all tests of purity.

Wolff quotes three new cases of fatal carbon tetrachloride intoxication, all running the usual course and showing the usual anatomo-pathological picture. The literature concerning the toxicological research on the drug is reviewed and the author describes a series of experiments in rabbits in which, after doses of 0·05–2 cc. per kg. weight, he was able to show invariably a more or less serious injury to the liver (fatty degeneration to central necrosis). In these experiments the same effect was produced by the separate fractions obtained by fractional distillation of a brand of carbon tetrachloride which had given rise to clinical intoxication. In cases in which the animals were kept alive long enough signs of repair in the affected parts of the hepatic acini were clearly demonstrated.

As a test for possible temporary injury of the liver by the drug in human subjects the author employed the estimation of the fibrin content of the blood (WOHLGEMUTH'S method). Extensive injury of the liver causes, or is anyhow without exception associated with, low fibrin values (FOSTER and WHIPPLE). In 3 rabbits as well as in 17 patients a temporary lowering of the fibrin value of the blood was shown after administration of moderate doses of carbon tetrachloride (3 cc. in the patients). It is never to be foretold whether such a temporary injury of the liver will yield to repair or not. The use of carbon tetrachloride under any circumstances is disapproved.

W. J. Bais.

MINOT (A. S.). **The Relation of Calcium to the Toxicity of Carbon Tetrachloride in Dogs.**—*Proc. Soc. Experim. Biol. & Med.* 1927. Mar. Vol. 24. No. 6. pp. 617–620. [12 refs.] [Vanderbilt Univ. Med. School, Nashville, Tenn.]

Whereas LAMSON and his associates were able to give as much carbon tetrachloride to dogs as 250 cc. without visible signs of intoxication [this *Bulletin*, Vol. 21, p. 411] the author lost most of his animals after 4 cc. They showed muscle twitching increasing in severity till almost all the muscles were involved in tetany. In LAMSON'S experiments the diet was well balanced ; in Minot's it was almost exclusively lean meat scraps containing very little bone, resulting in a radical decrease in the calcium intake. The dogs were found to have a high degree of bilirubinaemia and it is well known that bile salts combine with calcium in the blood, leaving a decreased concentration of ionized calcium. It was then found that the tetany could be prevented by intravenous administration of calcium chloride, and further that when calcium salts were added to the meat diet the dogs had the same tolerance for carbon tetrachloride as in LAMSON'S experiments. He notes that " the possibility that the production of serious symptoms by the lack of dietary calcium might occur as readily in any other jaundiced condition, may be a point of considerable clinical importance," and suggests that children should receive an adequate calcium diet preceding CCl_4 administration, and that calcium therapy should be tried in poisoning by this drug.

A. G. B.

Machado (Antenor). Essencia de chenopodio. [**The Constitution of Chenopodium.**]—*Brasil Medico.* 1927. May 21. Vol. 41. No. 21. pp. 498–500.

Chenopodium ambrosioides, the species found in Santa Maria, contains 40–42 per cent. of ascaridol. When heated to 160° C., this is transformed to an isomeric anhydride of ascaridol, glycol, which is present in the plant in a proportion of 5 per cent. It is a thick, viscid liquid, boiling between 138° and 140° under a pressure of 15 mm. Hg. The ascaridol possesses marked anthelmintic properties, especially acting on Ascaris and Ancylostoma, but feebly on Necator, and not at all on Oxyuris or Trichocephalus. The ascaridol glycol is a very weak anthelmintic.

A synthetic ascaridol is prepared which is reported to give surprisingly good results in doses of 4 drops for each year of age in children, and 70 drops for adults.

H. Harold Scott.

Graf (Hans) & Müller (I.). Kymographische Untersuchungen ueber die Adsorption aktiver Substanzen des Chenopodiumöls an Kohle. [**Researches on the Adsorption by Carbon of the Active Principles of Oil of Chenopodium.**]—*Arch. f. Wiss. u. Prakt. Tierheilk.* 1927. Jan. 16. Vol. 55. No. 4. pp. 349–360. With 8 text figs. [17 refs.]

It may be shown kymographically that oil of chenopodium and its constituents, ascaridol and paracymol, are adsorbed by medicinal charcoal (Merck), the first in a proportion of one part of the oil to 2 of carbon, the others respectively 1 : 1·5 and 1 : 3·5. Attempts to separate these mixtures by allowing to stand, by shaking, or by heat, were ineffectual. Further, adsorption in these proportions deprived the oil and its components of any activity. Should the anthelmintic effects and those harmful to the host be due to these adsorbable substances (a matter for future clinical study) then the above facts point to the benefit derivable from the use of charcoal in the treatment of toxic symptoms should they arise in course of treatment.

H. Harold Scott.

Meihuizen (F. H.). Een geval van Oleum-Chenopodii-vergiftiging met doodelijken afloop. [**A Case of Fatal Poisoning with Chenopodium Oil.**]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1927. Vol. 67. No. 2. pp. 312–313.

After self-administration of 10 cc. chenopodium oil, followed by Epsom salt, a European man, suffering from tapeworm (*T. solium*), got consecutively violent headache, central deafness, psychical symptoms, convulsions, rise of temperature; he became unconscious, paralytic, and died with symptoms of pulmonary oedema 5 days after the taking of the drug. No post-mortem examination could be made.

W. J. Bais.